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ANNUAL REVIEWS

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ecological behavior, employee green behavior, environmental sustainability, environmental psychology, natural environment, pro-environmental behavior

Abstract

Environmental sustainability has become an ethical and strategic imperative for organizations, and more and more employees are interested, encouraged, or instructed to act in environmentally sustainable ways. Consequently, organizational scholars have increasingly studied individual-level antecedents of employee pro-environmental or employee green behavior (EGB). We argue that, to advance this literature and to inform effective interventions, research should investigate how EGB, as a compound performance domain, is associated with antecedents and consequences at multiple levels (i.e., individual, team, work context, organization, society). Accordingly, we pursue three interrelated goals with this review. We first present a comprehensive review of research on EGB, including definitions, theoretical frameworks, methodological approaches, and empirical findings. Second, we develop an integrative conceptual model of EGB as the core of organizational environmental sustainability. Third, we conclude with recommendations for future theory development and methodological improvements, as well as practical implications for employees, leaders, and human resource management.

INTRODUCTION

Supplemental Material >

Recently, the problems caused by anthropogenic climate change, such as natural disasters (e.g., brushfires, floods) and the degradation of ecosystems, have become increasingly apparent. Indeed, since the 1980s, human demand on the environment has by far exceeded the biosphere's regenerative capacity (Wackernagel et al. 2002). The rapid and accelerating depletion of natural resources, pollution, and loss of biodiversity caused by human activities, especially economic activities such as industrial production, electricity generation, transport, and agriculture, increasingly threatens the long-term survival of biological life. These developments have spurred governments around the globe to commit to ambitious goals, such as significantly reducing their carbon emissions and reaching net-zero by 2050 (i.e., the Paris Agreement). In this context, environmental sustainability—the responsible interaction with the natural environment to ensure continued quality of life on Earth (World Comm. Environ. Dev. 1987)—has also become an ethical and strategic imperative for organizations (Ambec & Lanoie 2012).

Many organizations now include environmental performance goals in their triple bottom line strategy, alongside economic and social performance goals (Elkington 1998). Organizations are not only accountable toward their shareholders (i.e., economic performance) but also responsible for the safety and well-being of others, such as employees and customers (i.e., corporate social responsibility). Additionally, according to the triple bottom line, organizations are responsible for protecting the natural environment, which represents an indispensable foundation for human life and, thus, future economic activities (i.e., environmental performance; Etzion 2007, Starik & Rands 1995). Example initiatives that contribute to organizations' environmental sustainability include developing sustainable products and services (e.g., reusable coffee cups), conserving natural resources in business operations (e.g., use of solar or wind power), recycling materials (e.g., clothing fabric), and reducing pollution and waste (e.g., paper-free office). Such efforts are accompanied by growing numbers of (non)governmental programs that certify sustainable products and services (e.g., Boiral & Gendron 2011); customers and job seekers who pay attention to environmental sustainability (e.g., Collins et al. 2007, Pham & Paillé 2020); employees who are interested, encouraged, or instructed to act in sustainable ways at work (e.g., Lülfs & Hahn 2013, Unsworth et al. 2021); and leaders and entrepreneurs who want to go green for ethical reasons, to comply with governmental regulations, or to gain a competitive advantage (e.g., Demirel et al. 2019, Robertson & Barling 2015b).

Consistent with these societal and workplace trends regarding environmental sustainability, Ones & Dilchert (2012b) urged researchers in the fields of organizational psychology and organizational behavior to increasingly study the microfoundations of organizational environmental sustainability and, in particular, employee pro-environmental or employee green behavior (EGB). Since their call to action, the number of papers on EGB and related citations have steadily grown (**Supplemental Figure 1**). Moreover, scholars have offered four edited books (Huffman & Klein 2013, Jackson et al. 2012, Robertson & Barling 2015a, Wells et al. 2018), six systematic literature reviews (Francoeur et al. 2021, Inoue & Alfaro-Barrantes 2015, Lo et al. 2012a, Norton et al. 2015a, Young et al. 2015, Yuriev et al. 2018), and two meta-analyses (Katz et al. 2022, Wiernik et al. 2016) on the topic. In line with Ones & Dilchert's (2012b) call to action, most of the studies included in these reviews focused on the individual-level antecedents of EGB, such as employees' attitudes, values, perceived norms, and intentions (see also Lülfs & Hahn 2014).

We argue that, to advance this literature and to inform effective interventions, research should investigate how EGB is associated with antecedents and consequences at multiple levels (i.e., individual, team, work context, organization, society and culture). Accordingly, we pursue three interrelated goals with this review. We first present a comprehensive review of research on EGB,

including definitions of key dimensions, theoretical frameworks, methodological approaches, and empirical findings. Our focus is on the conceptualization of EGB as a compound performance domain, the main conclusions of previous systematic reviews and meta-analyses, as well as representative primary studies on EGB. Second, on the basis of our review and theoretical considerations, we develop an integrative conceptual model of EGB as the core of organizational environmental sustainability. This model focuses on both established and potential antecedents of EGB at the individual and various contextual levels, as well as on the largely neglected consequences of EGB. Third, on the basis of our review and conceptual model, we conclude with recommendations for future theory development and methodological improvements, as well as practical implications for employees, leaders, and human resource management (HRM). Overall, with this review, we hope to advance the momentum that ensued from Ones & Dilchert's (2012b) call to action and to inspire further rigorous research on EGB.

EMPLOYEE GREEN BEHAVIOR AS A COMPOUND PERFORMANCE DOMAIN

Pro-Environmental Behavior and Employee Green Behavior

In the environmental psychology literature, pro-environmental behavior has been defined as "behavior that harms the environment as little as possible, or even benefits the environment" (Steg & Vlek 2009, p. 309). Four broad types of pro-environmental behavior, including pro-environmental behavior in organizations, can be distinguished (see the sidebar titled Four Types of Pro-Environmental Behavior). EGB refers to "scalable actions and behaviors that employees engage in that are linked with and contribute to or detract from environmental sustainability" (Ones & Dilchert 2012a, p. 87). On the basis of an established understanding of work performance (see Campbell et al. 1993), this definition suggests that EGB entails measurable behaviors (i.e., in terms of frequency and/or quality) that are under the employee's control (i.e., as opposed to the outcomes of behavior) and that can be evaluated regarding their impact on the natural environment (Ones et al. 2018; see also Ciocirlan 2017). Many organizations now include environmental sustainability goals in their strategy. Thus, employees' behavior can be evaluated in terms of its contribution toward (or detraction from) these goals. EGB can be conceived of as the core of organizational environmental sustainability, because organizations cannot accomplish their environmental sustainability goals without employees at different hierarchical levels performing EGB (Ones et al. 2018).

Pro-environmental behavior: individuals' behavior that does not harm, harms as little as possible, or even benefits the natural environment

Work performance: goal-directed employee behaviors that contribute to organizational goals and that can be scaled in terms of their level of proficiency

FOUR TYPES OF PRO-ENVIRONMENTAL BEHAVIOR

Stern (2000) distinguished four types of pro-environmental behavior: environmental activism (e.g., active participation in environmental organizations and demonstrations, such as Greenpeace), nonactivist behavior in the public sphere (e.g., donating to environmental organizations, complying with environmental protection regulations), private sphere environmentalism (e.g., purchase, use, and disposal of personal and household products and services with environmental impact), and "other environmentally significant behaviors" (e.g., influencing the environmental actions of organizations). Regarding the last category, Stern (2000, p. 410) noted that "[s]uch behaviors can have great environmental impact because organizational actions are the largest direct sources of many environmental problems.... The determinants of individual behavior within organizations are likely to be different from those of political or household behaviors." Similarly, Starik & Rands (1995, p. 919) observed that "[i]ndividuals affiliated with organizations as owners, managers, employees, members, and volunteers bring critical ideas and energy to the 'greening' of their organizations."

As Stern (2000) noted, EGB differs from nonwork pro-environmental behaviors in that it is likely influenced by unique motives (e.g., no personal financial costs), opportunities and constraints regarding environmental sustainability (e.g., awareness, work role requirements), team norms, and coworker and leader behaviors, as well as organizational strategies, initiatives, culture, and climate (Lo et al. 2012a, Ones et al. 2018, Smith & O'Sullivan 2012). However, there may also be common antecedents of EGB and nonwork pro-environmental behavior, such as general pro-environmental attitudes (e.g., Bissing-Olson et al. 2013) or knowledge, skills, and habits regarding environmental sustainability (e.g., Paillé et al. 2019b).

Employee Green Behavior Dimensions

Organizational psychologists have characterized EGB as a compound performance domain that includes a meaningful set of employee behaviors that contribute to (or detract from) the shared organizational goal of promoting environmental sustainability (Campbell & Wiernik 2015). According to this conceptualization, EGB traverses several established first-order dimensions representing the latent structure of work performance, including task, citizenship, counterproductive, team member, and leadership performance (see also Ciocirlan 2017). This list is not comprehensive; scholars have proposed additional forms of performance that could be carried out with an environmental impact, such as adaptive, proactive, and innovative performance. EGB may be more relevant to some employees' formal job roles (e.g., an organization's sustainability officer) than to others (e.g., supermarket cashier). EGB may be formally prescribed by the organization (e.g., creating sustainable products, delivering services in sustainable ways). However, EGB can also be discretionary, in environmentally beneficial or harmful ways (e.g., switching the computer off when leaving the office, wasting paper at work), or involve particularly high levels of adaptability, initiative, or creativity (e.g., acting proactively, such as voicing suggestions, to make the organization more environmentally sustainable; Bissing-Olson et al. 2013, Yuriev et al. 2022). Moreover, EGB can be shown as part of work roles at different hierarchical levels, such as top managers' sustainable purchasing behavior (Yen & Yen 2012) or team members' advocacy for EGB among their coworkers (Kim et al. 2017).

EGB can be classified along three continuous dimensions (Francoeur et al. 2021). First, EGB can be carried out in-role (i.e., as part of employees' core tasks; Bissing-Olson et al. 2013) or extra-role (i.e., as organizational citizens; Boiral 2009, Daily et al. 2009). Second, EGB can be direct (i.e., employees acting themselves to benefit or harm the environment) or indirect (i.e., employees encouraging others at work to show EGB; Smith & O'Sullivan 2012). According to Smith & O'Sullivan (2012), indirect behaviors may be directed not only toward coworkers but also toward customers, supervisors, or more remote members of the organization (e.g., people working in other departments). Third, EGB can have low intensity (i.e., involving less effort, involving lower risk, being more incremental) or high intensity (i.e., involving higher effort and risk, being more radical; Ciocirlan 2017). For example, routinely switching off office lights has a lower intensity than voicing suggestions regarding environmental sustainability to upper management (Smith & O'Sullivan 2012 suggested a similar distinction, local versus wide impact of EGB).

In an effort to overcome the focus on discrete pro-environmental behaviors, such as recycling paper, Ones & Dilchert (2012a) developed the green five taxonomy of EGB based on thousands of critical incidents collected in the United States and Europe. Their hierarchical model includes an overall pro-environmental performance factor at the top, five broad EGB dimensions, and 17 narrow behavioral subdimensions below them (**Table 1**). Many other EGB constructs developed and measured can be assigned to one of the five EGB dimensions that Ones & Dilchert (2012a) propose (see Francoeur et al. 2021). First, the transforming dimension entails adapting

Green five: taxonomy with five broad performance-based dimensions of employee green behavior (transforming, conserving, avoiding harm, influencing others, taking initiative)

Table 1 Definitions of the green five/green six employee green behavior constructs and corresponding selected measures

Construct	Definition	Selected measures
Transforming	Behaviors aimed at changing work products and processes to make them more environmentally sustainable (Ones & Dilchert 2012a) Original subcategories: choosing responsible alternatives, embracing sustainable innovations, changing how work is done, creating sustainable products and processes Suggested additional subcategory: performing sustainable daily work (Francoeur et al. 2021)	Task-related pro-environmental behavior (Bissing-Olson et al. 2013) Note that transforming behaviors could also be discretionary (Ones et al. 2018).
Conserving	Behaviors aimed at preserving resources and avoiding wastefulness (Ones & Dilchert 2012a) Subcategories: recycling and composting, reusing, repurposing, and reducing use	Various conserving behaviors (Kim et al. 2017, Lamm et al. 2013, Stritch & Christensen 2016), self-enacted organizational environmental citizenship behavior (Robertson & Barling 2017), employee energy-conserving behaviors (Scherbaum et al. 2008)
Avoiding harm	Behaviors aimed at avoiding negative environmental impact and mitigating or restoring environmental damage (Ones & Dilchert 2012a) Subcategories: monitoring environmental impact, preventing pollution, and strengthening ecosystems	Environmental management activities (Cantor et al. 2012)
Influencing others	Behaviors aimed at spreading environmental sustainability behaviors to other people (Ones & Dilchert 2012a) Subcategories: educating and training; managing, facilitating, and coordinating; and leading, encouraging, and supporting	Organizational citizenship for the environment (Alt & Spitzeck 2016), eco-helping (Boiral & Paillé 2012), work group green advocacy (Kim et al. 2017), coworker-directed organizational environmental citizenship behavior (Robertson & Barling 2017)
Taking initiative	Environmental sustainability behaviors that are proactive, entrepreneurial, and involve personal risk and sacrifice (Ones & Dilchert 2012a) Original subcategories: initiating programs and policies, lobbying and activism, putting environmental interests first Suggested additional subcategories: environmental voice behavior and environmental civism (Francoeur et al. 2021)	Organizational citizenship for the environment (Alt & Spitzeck 2016), proactive pro-environmental behavior (Bissing-Olson et al. 2013), eco-initiatives and eco-civic engagement (Boiral & Paillé 2012), organization-directed organizational environmental citizenship behavior (Robertson & Barling 2017), environmental voice behavior (Temminck et al. 2015)
Counterproductive sustainability behaviors	Employee behaviors that risk or directly result in environmental harm (Dilchert 2018)	Counterproductive sustainability behaviors (Dilchert 2018), nongreen behaviors (Paillé et al. 2019a)

work products and processes to make them more environmentally sustainable. For example, task-related pro-environmental work behavior (i.e., the extent to which employees complete required work tasks in environmentally sustainable ways; Bissing-Olson et al. 2013) belongs to this EGB dimension. However, as Ones et al. (2018) suggest, transforming behaviors can also be discretionary. These researchers criticized the distinction between required and voluntary EGB (Norton et al.

2015a), because it confounds the motive for the behavior (i.e., required versus voluntary) with the content of the behavior (e.g., not printing emails).

Second, the conserving dimension includes behaviors that aim to preserve resources and avoid wastefulness (e.g., reducing use, recycling). Most EGB constructs and measures in the literature have focused only on this dimension (e.g., Lamm et al. 2013, Scherbaum et al. 2008). Third, avoiding harm involves reducing negative environmental behavior and mitigating environmental damage (e.g., preventing pollution). This category includes environmental management activities that aim to reduce emissions at work or to identify solutions to the company's environmental problems (Cantor et al. 2012). Fourth, influencing others entails promoting others' environmental behaviors (e.g., educating, training). This dimension covers coworker-directed organizational environmental citizenship behavior (Alt & Spitzeck 2016, Robertson & Barling 2017), eco-helping (Boiral & Paillé 2012), and work group green advocacy (Kim et al. 2017). Fifth, taking initiative involves proactive and entrepreneurial behaviors (e.g., initiating programs and policies, lobbying, activism). This dimension encompasses proactive pro-environmental behavior (Bissing-Olson et al. 2013), eco-initiatives and eco-civic engagement (Boiral & Paillé 2012); organization-directed organizational environmental citizenship behavior (Robertson & Barling 2017); and environmental voice behavior (Temminck et al. 2015).

Each of the green five dimensions includes both positive (e.g., saving energy) and negative (e.g., wasting energy) employee behaviors related to environmental sustainability. Nevertheless, Dilchert (2018) noted that various taxonomies of EGB do not include more severe negative or actively harmful employee behaviors. Accordingly, Dilchert (2018) introduced the construct of counterproductive sustainability behaviors, which represent a novel expression of counterproductive work behaviors applied to environmental sustainability (**Table 1**; see also Paillé et al. 2019a, who introduced the nongreen behaviors in the workplace construct). As environmental sustainability is a strategic goal of many organizations, employee behaviors associated with environmental harm can be considered counterproductive as they detract from the organization's goal and, thus, violate its legitimate interests.

THEORETICAL FRAMEWORKS

Social and Environmental Psychology Theories

Organizational scholars have evoked and tested numerous theories to better understand the nomological network of EGB, especially its antecedents (Ruepert et al. 2015). These theories include five prominent theoretical frameworks from social and environmental psychology. First, the theory of planned behavior suggests that people's attitudes, subjective norms, and perceived behavioral control predict their intentions, which, in turn, result in behavior (Ajzen 1991). For example, a study applied this theory to examine attitudes, subjective norms, and perceived control as antecedents of managers' corporate environmental market responsiveness, which includes activities such as use of environmentally sustainable packaging and product distribution (Rivera-Camino 2012). A more recent study investigated these factors as predictors of employee intentions to use sustainable commute options and to voice suggestions regarding environmental sustainability at work (Yuriev et al. 2020). Second, the norm-activation model suggests that pro-environmental behavior is influenced by personal norms or feelings of moral obligation, which are determined by people's awareness of the consequences of (not) performing a certain behavior and their feeling of responsibility for performing the behavior (Schwartz 1977). For instance, a study in the work context showed that awareness of consequences and ascription of responsibility predicted personal norms which, in turn, predicted employee energy-saving behaviors (Zhang et al. 2013).

Counterproductive sustainability behaviors: employee behaviors that risk or directly result in harm to the natural environment

Theory of planned behavior: psychological theory that links individuals' attitudes, subjective norms, and perceived behavioral control to behavioral intentions and behavior

Norm-activation model: psychological theory that links personal norms, awareness of consequences, and feelings of responsibility to prosocial and pro-environmental behavior

Thus, in contrast to the theory of planned behavior, which emphasizes rational decision-making, the norm-activation model assumes that behavior is driven by moral values.

Third, extending norm-activation theory, the value-belief-norm theory of environmentalism proposes that personal values predict environmental beliefs and, in turn, pro-environmental personal norms and behavior (Stern 2000, Stern et al. 1999). For example, a study that employed this theory in the work context found that personal norms mediated the association between environmental worldviews and employees' energy-conservation behaviors (Scherbaum et al. 2008). Fourth, a social identity theory approach to pro-environmental behavior suggests that in-group identification, in-group norms and goals, and collective efficacy beliefs predict environmental actions (Fritsche et al. 2018). Drawing on the social identity approach, an early study showed that employees who received comparative feedback (i.e., how their unit performed compared with another unit) saved more energy than employees who only received information about their own unit's performance (Siero et al. 1996). A more recent study found that an organizational ethic of care predicts EGB through greater organizational identification and employee satisfaction with organizational sustainability (Carmeli et al. 2017). Finally, social exchange theory suggests that people perceive an obligation to reciprocate when they receive rewards or bear costs in a dyadic relationship (Thibaut & Kelley 1959). For example, a study in the work context observed a positive association between organizational support and EGB among employees with a strong exchange ideology (i.e., high importance of reciprocated beneficial treatment; Paillé & Meija-Morelos 2019). Another study showed that employees' perceptions of beneficial organizational practices (i.e., supervisory support, rewards, and training) were positively related to their EGB (Cantor et al. 2012).

Conceptual Models of Employee Green Behavior

Drawing in part from social and environmental psychology theories, organizational scholars have developed several conceptual models of EGB. For instance, the comprehensive action determination model of sustainable behavior in companies integrates constructs and assumptions of the theory of planned behavior (e.g., sustainability attitudes and intentions) and the norm-activation model (e.g., social and personal moral norms) with theorizing on situational influences (e.g., organizational routines, sustainability climates) and habits (Lülfs & Hahn 2014). Norton et al. (2015a) developed a conceptual model of multilevel influences on pro-environmental motivation and EGB based on an integration of person–environment interaction, self-determination, and work performance theories. According to this model, individual factors (e.g., attitudes, personality) interact with contextual factors (e.g., leadership) in predicting controlled ("I have to") and autonomous ("I want to") motivational states related to environmental sustainability. These motivational states influence required or voluntary EGBs which, in turn, are assumed to predict outcomes at the employee (e.g., future intentions), team (e.g., social norms), organizational (e.g., cost effectiveness), and societal (e.g., competitive advantage) levels. Finally, Young et al. (2015) developed a process framework of macrodeterminants of EGB. In addition to various individual (e.g., environmental awareness, attitudes) and group factors (e.g., feedback, financial incentives), this framework includes organizational factors (e.g., policies, infrastructure, management support and training) and external factors (i.e., policy and economic context, environmental actions at home) as antecedents of EGB.

Given the definition of EGB as a compound performance domain, it is surprising that theorizing in this area has neglected well-established frameworks of the antecedents of work performance or focused only on selected predictors (e.g., motivation; Norton et al. 2015a). In particular, Campbell et al.'s (1993) theory of work performance suggests that performance dimensions such

as EGB have three direct determinants: declarative knowledge, procedural knowledge or skills, and motivation (i.e., choice behavior regarding the direction, intensity, and duration of effort). These three factors are assumed to mediate the indirect effects of more distal determinants, such as abilities, personality, attitudes, affective states, and contextual factors. For example, individual differences in pro-environmental attitudes may positively affect EGB via motivation, whereas an environmental sustainability training could influence EGB through improvements in knowledge and skills. Another well-established model suggests that, in addition to ability and motivation as determinants, it is essential that employees have the opportunity to perform (Blumberg & Pringle 1982). Thus, beyond individual factors, contextual factors that facilitate or constrain engagement in EGB also need to be considered. Finally, EGB is an active and dynamic form of employee performance that can be understood from the perspective of action regulation theory (Zacher & Frese 2018). This meta-theory focuses on the process of action regulation in the work context, including employees' goal development and selection, orientation in the environment, planning, monitoring of execution, and feedback processing. Additionally, the theory explains the hierarchical structure of action regulation, including routinization of behavior (e.g., developing energy conservation habits) and reintellectualization of routine behavior (e.g., becoming aware of wasteful behavior). We revisit these established theories of work performance below when we develop our integrative conceptual model of EGB.

METHODOLOGICAL APPROACHES

Research Design

New constructs in the fields of organizational psychology and organizational behavior are most often studied using cross-sectional research designs, and research on EGB is no exception. A review of 118 journal articles on pro-environmental behavior published in 14 organizational science journals between 2002 and 2013 found that 96 studies (81%) used a quantitative approach, 18 (16%) used a qualitative approach, and 4 (3%) combined quantitative and qualitative methods (Ozbilir & Kelloway 2015). Of the studies employing a quantitative approach, 87 (91%) used a correlational design [only 4 (4%) of these were based on longitudinal data], 7 (7%) were experimental, and 2 (2%) reported only descriptive statistics. Most of the quantitative studies used archival data (74%) and/or surveys (44%). Of the 18 qualitative studies, 13 (72%) used a case study approach and 5 (28%) a grounded theory approach [2 (11%) of these were longitudinal]. Most qualitative studies used interviews (88%), documentation (55%), and/or observations (16%; for further details, see Ozbilir & Kelloway 2015). Overall, this review suggests that most early research on EGB made use of cross-sectional, between-person study designs as well as archival data and employee self-reports.

Over the past decade, research on EGB has matured and begun to make use of designs that allow for studying within-person variability in EGB over time. Specifically, researchers have used experience sampling and daily diary methods that help to disentangle between- and within-person variation in EGB (Bissing-Olson et al. 2015). For example, a daily diary study across 10 workdays explored associations between daily positive affect and task-related and proactive EGB, as well as pro-environmental attitudes as a between-person moderator of these relations (Bissing-Olson et al. 2013). Another daily diary study showed that employees' pro-environmental intentions positively predicted next-day EGB, but only when employees reported that their company had an environmental sustainability policy and an associated favorable pro-environmental organizational climate (Norton et al. 2017). Importantly, these daily diary studies focused exclusively on employee self-reports and within-person variation (not systematic longitudinal change over time) in EGB. Multisource, multilevel, and multiwave studies are still very rare in this area of research (for exceptions, see Kim et al. 2019, Tian & Robertson 2019).

Action regulation theory: psychological theory that explains how individuals regulate their goal-directed behavior in the work context

Pro-environmental organizational culture and climate: employees' shared values, beliefs, and assumptions (culture) and their shared perceptions of policies, procedures, and practices (climate) regarding environmental sustainability

Several papers have reported the results of experimental and intervention studies designed to enhance EGB, although studies adopting such designs are also relatively rare (for reviews of best practices regarding the design of interventions, see Endrejat et al. 2015, Unsworth et al. 2013). For example, results of two laboratory experiments demonstrated that environment-specific transformational leadership and HRM practices interact in predicting EGB (e.g., choice to print on new or recycled paper), such that EGB is highest when both leadership and HRM are high (Peng et al. 2020). Another paper reported the results of three quasi-experimental studies, which suggest that emotional displays in fictional news videos about climate change influence EGB; in particular, displays of the negative and high-arousal emotions of anger and fear led to higher EGB, whereas displays of sadness reduced EGB (Russell & Ashkanasy 2021). Two intervention studies showed that increasing self-concordance of sustainable energy use and commuting (i.e., linking these behaviors to personally important goals) increased employees' intentions to show these forms of EGB compared with the control conditions (Unsworth & McNeill 2017). More recently, a study examined the boundary conditions that influence employees' engagement in a green HRM intervention designed to promote EGB (Davis et al. 2020). Results showed that the more feedback employees received on their behavior during the intervention, the higher their subsequent EGB. This finding was qualified by a complex three-way interaction, such that employees with weak autonomous motivation benefited most from feedback and high goal commitment with regard to their EGB after the intervention.

Finally, qualitative research designs have been used to gain a deeper understanding of the factors that enable or constrain EGB. Several case studies on the implementation of environmental sustainability initiatives in various companies (e.g., 3M, Aveda Corporation, Caribou Coffee, Daimler AG, McDonald's, Procter & Gamble) are presented in Jackson et al.'s (2012) edited book. More recently, results of a qualitative interview study explored the rhetorical strategies employees use to accept or reject corporate environmentalism, for example, by associating or dissociating environmental values from other corporate values (Onkila 2017). Another study, based on semistructured interviews with managers, consultants, and experts in natural resource companies, explored the role of employee involvement in improving corporate biodiversity management practices (Boiral et al. 2019). Results suggest that the obstacles to greater employee involvement include the complexity of biodiversity issues, lack of corporate commitment, externalization of initiatives, and lack of training.

Measures

Several self-report measures have been developed to assess different forms of EGB (for examples, see **Table 1**). In addition to measures tapping discrete pro-environmental behaviors, such as printing double-sided, using recycling bins, or turning off lights (e.g., Robertson & Barling 2013), organizational scholars have developed measures of EGB as a compound performance domain with dimensions that correspond to established multidimensional work performance taxonomies (Campbell & Wiernik 2015). For example, there are survey measures to assess task-related and proactive EGB (Bissing-Olson et al. 2013), organizational citizenship behavior for the environment (Boiral & Paillé 2012, Robertson & Barling 2017), and counterproductive sustainability behaviors (Dilchert 2018).

Of these performance-related EGB dimensions, organizational citizenship behavior for the environment is the most widely studied construct. Validation efforts have shown that the construct is positively related to, yet distinct from, traditional organizational citizenship behavior and related constructs (e.g., perceived organizational support, affective commitment; Lamm et al. 2013, Paillé & Boiral 2013). Unfortunately, some measures of this EGB dimension have used the

Green human resource management (HRM) practices: the use of employment practices (e.g., recruitment, selection, training, performance management, compensation, employee involvement) to promote organizational environmental sustainability

Organizational citizenship behavior for the environment: discretionary employee behavior that contributes to organizational environmental sustainability and is not explicitly recognized by the formal reward system

same label but the items reflect very different content. For example, one survey measure of organizational citizenship behavior for the environment measures the three dimensions eco-helping, eco-civic engagement, and eco-initiatives (Boiral & Paillé 2012); another survey scale operationalizes the same construct using a single dimension of various conserving behaviors (e.g., recycling, reusing, saving energy; Lamm et al. 2013); a third scale with the same label measures six dimensions, including pro-environmental helping behavior, sportsmanship, organizational loyalty, organizational compliance, individual initiative, and self-development (Alt & Spitzeck 2016); and yet another organizational citizenship behavior for the environment scale measures self-enacted, coworker-directed, and organization-directed behaviors (Robertson & Barling 2017). These measures have so far not been assessed in a single study to evaluate their empirical distinctiveness or overlap. Thus, some EGB measures currently seem to suffer from the so-called jingle and jangle fallacies, which entail the erroneous assumptions that two constructs are the same because they have the same label (i.e., jingle fallacy) or that two very similar constructs are distinct because they have different labels (i.e., jangle fallacy; Kelley 1927).

Francoeur et al. (2021, p. 18) conducted a systematic review of EGB measurement scales published between 1977 and 2016 to "determine the degree of methodological maturity" of this research area. This review, which includes 53 studies, categorized existing measures according to the green five EGB dimensions (Ones & Dilchert 2012a) and identified five major trends in this literature. First, most scales were developed to assess green office behaviors (e.g., paper recycling, double-sided printing, turning off lights), whereas little research on EGB has been conducted in other settings (e.g., production, customer service). Specifically, most items (48%) were in the conserving category of the green five taxonomy, while transforming and avoiding harm (4% each) were the least examined. Second, Francoeur et al. (2021) noted substantial redundancy of certain items across different measures. Of the 53 studies, 22 (42%) developed new survey items for EGB, whereas 24 (45%) used previously published items [the remaining 7 (13%) used qualitative methods, experiments, or direct observations]. Accordingly, Francoeur et al. (2021, p. 30) called for "a moratorium on new green workplace behavior measures until an assessment of existing measures has been carried out." Third, compared with other dimensions of EGB, the researchers observed a relative dearth of measures for counterproductive green behaviors (see also **Table 1**). Fourth, this review identified three new subcategories of EGB that were not yet included in the green five taxonomy but could be included in the higher-order dimensions transforming and taking initiative: performing sustainable daily work (e.g., daily task-related EGB; Bissing-Olson et al. 2013), environmental voice behavior (e.g., making suggestions related to environmental sustainability; Temminck et al. 2015), and environmental civism (e.g., eco-civic engagement; Boiral & Paillé 2012). Interestingly, 60% of items included in the review referred to direct EGBs (i.e., taking action oneself), whereas 40% of items referred to indirect EGBs (e.g., influencing actions of others). Finally, Francoeur et al. (2021) observed that most items (41%) explicitly focus on voluntary EGB, whereas only 5% of items explicitly referred to in-role or task-related behaviors (55% did not mention level of inclusion in the task). Most items (72%) referred to individual employee behaviors, whereas only 13% measured leader behaviors, 7% referred to dyadic behaviors (e.g., supervisor–subordinate interactions), and 8% referred to collective behaviors (e.g., team level). Francoeur et al. (2021, p. 37) concluded their review by noting that "the time has also come for a measurement clean-up in the field of green behavior." In addition to using theory-based measures and avoiding redundancies, they suggested using more objective measures (e.g., energy consumption in kilowatt hours; Carrico & Riemer 2011) and adapting self-report scales to reduce measurement bias (e.g., referring to last day instead of last year; Kormos & Gifford 2014).

Jingle fallacy:
erroneous assumption that two different constructs or measures are the same because they have the same label

Jangle fallacy:
erroneous assumption that two identical constructs or measures are different because they have different labels

EMPIRICAL FINDINGS

In this section, we categorize key findings on EGB according to theoretical order (i.e., antecedents versus consequences of EGB) and conceptual level (i.e., individual versus contextual factors). Individual factors include stable between-person differences (e.g., personality) and more dynamic within-person phenomena (e.g., affective states). Contextual factors include work context characteristics, leadership and supervisor support, coworker and team characteristics, and organizational factors, as well as broader societal and cultural characteristics. Note that, although studies typically develop theoretical models on antecedents and consequences of EGB, most studies adopt cross-sectional research designs (see the previous section). Thus, the causality implied by the models requires further experimental and longitudinal research.

Individual Antecedents of Employee Green Behavior

Numerous studies have examined individual-level antecedents that may either facilitate or constrain EGB (Wiernik et al. 2018). On the basis of their early review of 21 studies, Lo et al. (2012a, p. 2933) concluded that "[w]ith respect to individual-specific determinants, the results show relatively consistent effects for attitudinal determinants and past behavior." Lülfs & Hahn (2014) and Norton et al. (2015a) included pro-environmental attitudes, beliefs and habits, personal norms, motivations, positive affect, and intentions as key individual-level predictors of EGB in their integrative models. Another review identified several potential barriers to EGB at the person level, including low organizational commitment, lack of perceived social norms, low perceptions of infrastructure regarding environmental sustainability, unfavorable pro-environmental attitudes, lack of time and knowledge, low self-efficacy, unwillingness to change habits, low awareness of environmental problems, and laziness (Yuriev et al. 2018). Overcoming these person-related barriers could represent an important starting point for facilitating EGB in organizations. In the following, we provide an overview of research on individual-level antecedents of EGB, including demographic characteristics; attitudes, beliefs, and intentions; knowledge, skills, and abilities; personality; and affective and motivational states.

Demographic characteristics. Notwithstanding a lack of theory, research has investigated associations between demographic characteristics and EGB (Klein et al. 2012). A meta-analysis reported a weak positive association ($\rho = 0.10$, $k = 22$ studies) between age and EGB (Wiernik et al. 2016). A more recent meta-analysis (Katz et al. 2022) also found a weak positive relationship ($\rho = 0.08$, $k = 66$) between age and EGB, as well as weak positive associations between EGB and tenure ($\rho = 0.09$, $k = 50$) and educational level ($\rho = 0.07$, $k = 42$). The relationship between gender and EGB was not significant ($\rho = 0.01$, $k = 56$).

Attitudes, beliefs, and intentions. Scholars have examined various individual-level antecedents of EGB based on the theory of planned behavior (e.g., Manika et al. 2015). A meta-analysis (Katz et al. 2022) found moderately positive associations between EGB and pro-environmental attitudes ($\rho = 0.45$, $k = 67$), perceived pro-environmental norms ($\rho = 0.46$, $k = 18$), pro-environmental perceived behavioral control ($\rho = 0.41$, $k = 20$), self-efficacy ($\rho = 0.40$, $k = 6$), and pro-environmental behavioral intentions ($\rho = 0.45$, $k = 13$). Furthermore, this meta-analysis found a weak association between job satisfaction and EGB ($\rho = 0.15$, $k = 10$) and stronger associations between organizational commitment ($\rho = 0.30$, $k = 17$) and organizational identification ($\rho = 0.35$, $k = 13$) and EGB. However, due to a lack of theory regarding these job attitudes and EGB, as well as the cross-sectional nature of the primary studies included in the meta-analysis, the causal direction of these relationships remains unclear. Finally, a recent review identified unfavorable pro-environmental attitudes, lack of social norms regarding environmental

sustainability, low self-efficacy, low awareness of environmental problems, and low organizational commitment as person-related barriers to EGB (Yuriev et al. 2018).

Knowledge, skills, and abilities. Even though the definition of EGB as a compound performance domain suggests that knowledge and skills are direct determinants of EGB (Campbell & Wiernik 2015), very few studies have focused on these and related predictors, such as experience, routines, or habits. Moreover, there are currently no studies on links between general mental ability, a key predictor of work performance (Campbell & Wiernik 2015), and EGB. This is perhaps because these potential antecedents cannot be easily assessed using self-report surveys. An early study showed that prior experience with household recycling positively predicted office recycling behavior (Lee et al. 1995). Another study examined associations between managers' environmental knowledge, values, and EGB (Fryxell & Lo 2003). Results showed that knowledge and values were better predictors of reactive managerial behaviors (e.g., keeping informed of environmental laws and regulations relevant for the business) than of proactive pro-environmental behaviors (e.g., taking action where possible to reduce the amount of resources used in the company's processes). An intervention study found that monthly group-level feedback on energy consumption and the use of peer educators to disseminate information and to motivate colleagues led to reductions in energy use (Carrico & Riemer 2011). A qualitative study suggested links between habits or routinized behaviors and energy-conservation behaviors in offices; for instance, a participant noted that lights "go on in the mornings and go out when you go home. . . . When you have a meeting, you don't switch it off for an hour. . . . It's a habit, absolutely" (Lo et al. 2012b, p. 235). Another study developed a taxonomy of employee green competencies, which represent heterogeneous constructs that include pro-environmental knowledge, skills, abilities, attitudes, behavior, and awareness (Cabral & Dhar 2019). Finally, a systematic review identified lack of knowledge of green behaviors in the workplace and unwillingness to change habits as important person-related barriers to EGB (Yuriev et al. 2018).

Personality characteristics. Despite a large body of research on personality predictors of established forms of work performance (e.g., task performance, citizenship behavior), relatively few studies have examined associations between personality characteristics and EGB. For instance, Kim et al. (2017) reported that the traits conscientiousness and moral reflectiveness were positively related to voluntary EGB of team leaders and members. Consistently, a meta-analysis (Katz et al. 2022) found moderate positive associations between EGB and conscientiousness ($\rho = 0.32$, $k = 10$), openness to experience ($\rho = 0.37$, $k = 6$), and moral reflectiveness ($\rho = 0.38$, $k = 6$). In contrast, EGB was not significantly associated with extraversion, agreeableness, and neuroticism. Regarding counterproductive sustainability behaviors, a set of three studies showed that personality-based integrity (i.e., a compound trait strongly associated with conscientiousness, agreeableness, and low neuroticism) was the single best predictor, such that people with high integrity scores showed fewer counterproductive sustainability behaviors (Dilchert 2018). Moreover, and also consistent with the literature on general counterproductive work behaviors, counterproductive sustainability behaviors were negatively related to conscientiousness, agreeableness, extraversion, and openness to experience, and positively related to neuroticism.

Affective and motivational states. As with established forms of work performance, researchers have linked experiences of positive and negative affect with EGB (Russell & Friedrich 2015). For example, a daily diary study found that low-arousal positive affect positively predicted task-related EGB among all employees, whereas high-arousal positive affect positively predicted proactive EGB only among employees with a less favorable pro-environmental attitude (Bissing-Olson et al. 2013). Another study found that leaders' environmental descriptive norms predicted their

environment-specific transformational leadership and their EGB, which in turn predicted followers' harmonious environmental passion (i.e., a positive emotion linked to pro-environmental motivation) and EGB (Robertson & Barling 2013). Finally, and consistent with the model by Norton et al. (2015a), studies have shown that autonomous and controlled forms of motivation mediate positive associations between leaders' environment-specific transformational leadership (Graves et al. 2013), pro-environmental attitude (Tian et al. 2020), and EGB.

Contextual Antecedents of Employee Green Behavior

Contextual antecedents include factors external to employees that either facilitate (i.e., opportunities to perform; Blumberg & Pringle 1982) or constrain EGB (i.e., barriers to perform; Yuriev et al. 2018). An early review of the EGB literature concluded the following: "For organization-specific influences, management and physical facilitation were frequently significant.... [I]t is recommended that interventions focus on physical facilitation, tailored persuasive communication, and active engagement of middle management" (Lo et al. 2012a, p. 2933). Findings regarding other contextual factors (e.g., social comparison, organizational culture) were less conclusive at the time. Another review suggested that organizational policies, practices, and procedures; organizational culture; job requirements; leadership and supervisory support; and team social norms are relevant contextual predictors (Inoue & Alfaro-Barrantes 2015). A review of contextual barriers to EGB identified a nongreen corporate culture, job constraints (e.g., lack of autonomy, lack of communication), lack of internal resources (e.g., financial, human capital), and lack of support and guidance from supervisors and colleagues (Yuriev et al. 2018). In the following, we provide an overview of research on key contextual antecedents of EGB, including work context characteristics, leadership and supervisor support, coworkers and team characteristics, organizational factors, and broader societal and cultural characteristics.

Work context. Little research has examined characteristics of the work context as antecedents of EGB, despite suggestions that occupational characteristics (Dierdorff et al. 2013) and technology (Behrend & Thompson 2013) may play an important role for this form of performance. Some research suggests that physical facilitation (e.g., providing containers for recycling) provides employees with the opportunity to engage in EGB (Lo et al. 2012a). Another study compared green and nongreen occupations in terms of human capital and skill requirements, showing that green jobs demand higher levels of formal education, work experience, on-the-job training, and high-level cognitive and interpersonal skills (Consoli et al. 2016). With regard to job characteristics, a field experiment showed that, in addition to the provision of relevant information and feedback, granting employees higher autonomy over their task assignments enhanced energy-saving behavior (Siero et al. 1989). More recently, a study showed that meaningful work mediated the positive association between perceived organizational support for the environment and EGB (Bhatnagar & Aggarwal 2020). Finally, a lack of job autonomy, communication, and internal resources (e.g., financial, human capital) have been identified as important work context–related barriers to EGB (Yuriev et al. 2018).

Leadership and supervisor support. Leadership and supervisor behavior have received considerable attention as antecedents of EGB (for reviews, see Paillé 2018, Robertson & Barling 2015b). Early studies and reviews suggested that the environment-related involvement of superiors is an effective way to enhance subordinates' EGB (Erdogan et al. 2015, Lo et al. 2012a, Norton et al. 2015a, Ramus & Steger 2000). Consistently, a meta-analysis (Katz et al. 2022) found moderate associations between EGB and perceptions of environment-specific transformational leadership ($\rho = 0.49, k = 11$), servant leadership ($\rho = 0.37, k = 7$), and supervisor support ($\rho = 0.35, k = 14$).

Additionally, primary studies showed that EGB relates to other dimensions of leadership, such as top management commitment and prompts to enhance workplace energy reduction (Russell et al. 2016) and Taoist leadership (i.e., rejection of domination, reverse thinking, selflessness; Xing & Starik 2017). More recently, studies have focused on the mechanisms of associations between leadership and EGB. For instance, a study showed that coworker green advocacy mediated the relationship between leader EGB and subordinate EGB (Kim et al. 2017). Environment-specific transformational leadership positively predicted EGB via employee perceptions of coworker pro-environmental climate among employees with high environmental locus of control (Robertson & Carleton 2018). Environment-specific transformational leadership predicted EGB at the team level via team pro-environmental goal clarity and harmonious passion, especially in teams with greater power distance (Peng et al. 2021). With regard to antecedents of counterproductive sustainability behaviors, a three-wave study found that supervisory support for the environment had a negative indirect effect on nongreen employee behaviors (e.g., "In the workplace, I do not care about the consumption of water or electricity") through employee environmental commitment (Paillé et al. 2019a). Consistently, lack of supervisory support and role models have been identified as key barriers to EGB (Yuriev et al. 2018).

Coworkers and team characteristics. Research suggests that coworker support, social norms, and team climate play important roles as facilitators of EGB (Norton et al. 2015a), and the lack of these social factors may represent a significant barrier to EGB (Yuriev et al. 2018). For example, a study showed that employees' perceptions of their coworkers' involvement in environmental sustainability mediated the positive association between the perceived presence of an organizational sustainability policy and proactive EGB (Norton et al. 2014). Likewise, perceived coworker support led to eco-helping among colleagues via a social exchange process (Paillé et al. 2016). Finally, the association between employees' perceptions of their organization's corporate social responsibility and EGB was mediated by coworkers' pro-environmental advocacy and organizational identification (Shah et al. 2021).

Organizational factors. Organizational-level antecedents of EGB include environmental strategies (i.e., sustainability policies, mission, goals, plans, resource allocation decisions), initiatives (i.e., organizational programs, practices, and interventions; Ones et al. 2018), and pro-environmental culture and climate (Norton et al. 2015b). A nongreen corporate culture has been identified as an important barrier to EGB (Yuriev et al. 2018). Early reviews focused exclusively on organizational-level associations (Etzion 2007) or concluded that organizational determinants had weak or inconsistent effects on EGB (Lo et al. 2012a). However, more recent research finds support for these factors, at least for organizational characteristics perceived by employees. This trend is similar to research on corporate social responsibility, which over the past decade has increasingly adopted multilevel models to better understand the psychological microfoundations of the effects of organizational-level factors on employees (Rupp & Mallory 2015). A meta-analysis (Katz et al. 2022) finds moderate associations between EGB and corporate social responsibility ($\rho = 0.64$, $k = 15$), perceived organizational support ($\rho = 0.23$, $k = 18$), perceptions of green HRM ($\rho = 0.40$, $k = 23$), and green psychological climate ($\rho = 0.49$, $k = 19$).

Regarding organizational environmental strategies, research has found positive associations between the presence of an organizational environmental sustainability policy and EGB (Norton et al. 2014, Ramus & Steger 2000). Moreover, the presence of a policy, via green psychological climate, strengthened the positive association between employees' daily pro-environmental intentions and EGB (Norton et al. 2017). Other aspects of organizational strategy, for instance whether policies are more reactive (i.e., compliance with regulations) or proactive (i.e., based on strategic or ethical considerations; Ones et al. 2018), have so far been neglected.

Most research on organizational environmental initiatives has focused on green HRM, which entails the use of employment practices to promote organizational environmental sustainability. These practices include green personnel recruitment and selection; onboarding, training, and personnel development; performance management and appraisal; rewards and compensation; and employee involvement (Tang et al. 2018). A study showed that an index of organizations' overall green HRM (including green training, performance appraisals, and compensation) was positively related to supervisor ratings of in-role and extra-role EGB via psychological green climate (Dumont et al. 2017).

Regarding specific green HRM practices, a review of 22 studies published between 2008 and 2017 reports that the effects of green recruitment and selection practices on job seekers' perceptions of organizational attractiveness are mediated by anticipated pride, perceived value fit, expectation of favorable treatment, and perceived organizational green reputation (Pham & Paillé 2020). Thus, as is also suggested by research on the microfoundations of corporate social responsibility (Rupp & Mallory 2015), the effects of green HRM on individual outcomes seem to be transmitted by psychological mechanisms. Moderators of these effects include job seekers' pro-environmental attitude, environmental consciousness, and the desire to have a significant impact through work. Furthermore, several studies have focused on environmental sustainability or green employee training as part of green HRM. For instance, studies showed that such training positively predicted employees' environmental commitment (Paillé & Valéau 2021) and EGB (Paillé et al. 2020) via perceived organizational support for the environment.

Scholars have further recommended various forms of organizational interventions to enhance EGB, such as providing information regarding environmental sustainability, goal setting and feedback, persuasive communication, and participatory designs (Endrejat et al. 2015, Lo et al. 2012a). These recommendations are consistent with findings of a meta-analysis on experimental treatments designed to enhance nonwork pro-environmental behavior; the most effective treatments were creating cognitive dissonance, goal setting, social modeling, and prompts (Osbaldiston & Schott 2012). Young et al. (2015) conducted a systematic review of 17 empirical studies on organization-based behavior change initiatives with pre- and postintervention measures and objective indicators (or outcomes) of EGB (e.g., energy use). Findings suggest that the best predictors of the effectiveness of interventions are environmental awareness (e.g., providing information, enhancing knowledge, reminders), performance feedback at individual and group levels, financial incentives at individual and group levels, the provision of environmental infrastructure (e.g., accessibility of equipment, provision of services), and management support. Interestingly, the researchers also concluded that pro-environmental attitude change is less important for employee behavior change in comparison to awareness of, and knowledge and skills regarding, organizational environmental policies and environmental actions.

In contrast to green HRM practices and organizational interventions, the impact of other organizational environmental sustainability initiatives on EGB, such as the creation of green tasks, jobs, and specialized job roles (Consoli et al. 2016); the development of green products and services; the implementation of specific sustainability programs (e.g., recycling initiatives); and the use of environmental management systems and associated certification processes (Boiral & Gendron 2011), has been rather neglected in the literature (see Ones et al. 2018).

Finally, pro-environmental organizational culture entails the shared values, beliefs, and assumptions of organizational members regarding the correct way to think and feel about environmental sustainability, whereas pro-environmental organizational climate refers to employees' shared perceptions of environmental sustainability policies, procedures, and practices that an organization rewards and supports (Norton et al. 2015b). It is generally assumed that shared organizational climate perceptions mediate the effects of organizational culture on employee attitudes

and behavior. However, research thus far has focused only on associations between employees' individual perceptions (i.e., psychological climate) and EGB (e.g., Norton et al. 2017) and neglected the study of team or organizational-level culture and climate constructs (i.e., employee perceptions aggregated to the team or organizational level).

Societal context and culture. The role of broader societal factors, such as government regulations and laws, for EGB has received very little attention. An exception is a qualitative study, which suggests that compliance with regulations, preemption of future regulations, and local institutional networks such as community groups impact EGB in the US winery industry (Marshall et al. 2005). Moreover, although studies on EGB have been conducted in various cultures and countries, including Australia, China, Russia, Uganda, and the United States, there are currently no studies that compare EGB across different cultural or national contexts. A recent exception is a qualitative study that found cultural and contextual specificities regarding EGB among Canadian and Colombian employees (Yuriev & Sierra-Baron 2020). Moreover, scholars have coded individual studies included in a meta-analysis in terms of 11 cultural dimensions and examined whether they moderated the positive association between pro-environmental attitude and EGB (Katz et al. 2022). Results were largely inconclusive; high levels of the cultural dimension hierarchy strengthened, whereas high levels of mastery in a culture weakened, the positive association between pro-environmental attitude and EGB.

Consequences of Employee Green Behavior

Although most research so far has focused on (mostly individual) antecedents of EGB, several recent studies have examined its potential individual and contextual consequences. Regarding individual outcomes, an experimental vignette study showed that EGB explained variance in manager ratings of overall work performance, above and beyond task performance, citizenship behavior, and counterproductive behavior (Bohlmann et al. 2018b). Additionally, results of a multiwave study suggested that job satisfaction is both an antecedent and an outcome of EGB, depending on the gender composition of teams (Kim et al. 2019). Finally, a study found positive effects of EGB on self-esteem and, in turn, well-being (Zhang et al. 2021).

Regarding the broader contextual consequences of EGB, Lo et al. (2012a, p. 2933) argued that "an understanding at the behavioral level of analysis may be essential to a better understanding of the precise mechanisms that underlie aggregate environmental performance." Consistently, research has found positive relationships between EGB and organizational environmental performance. An early study showed that EGB was associated with companies' environmental competitive advantage (Del Brío et al. 2007). More recently, a study by Boiral et al. (2015) showed that managers' engagement in EGB positively predicted the implementation of environmental management practices and, in turn, unit environmental performance. Another study found that organizations' environmental strategy positively predicted EGB and, in turn, firm environmental performance (Chen et al. 2015). Finally, a study with data collected from top management team members, CEOs, and frontline workers showed that EGB mediated the association between strategic HRM and firms' environmental performance (Paillé et al. 2014).

INTEGRATIVE CONCEPTUAL MODEL

We present an integrative conceptual model that conceives EGB as the core of environmentally sustainable organizations (**Figure 1**). First, EGB is conceptualized as a compound performance domain with multiple distinct dimensions (e.g., task-related, citizenship, proactive, innovative, counterproductive) that may have shared and unique antecedents and consequences. For example, consistent with research on task and contextual performance (Campbell & Wiernik 2015),
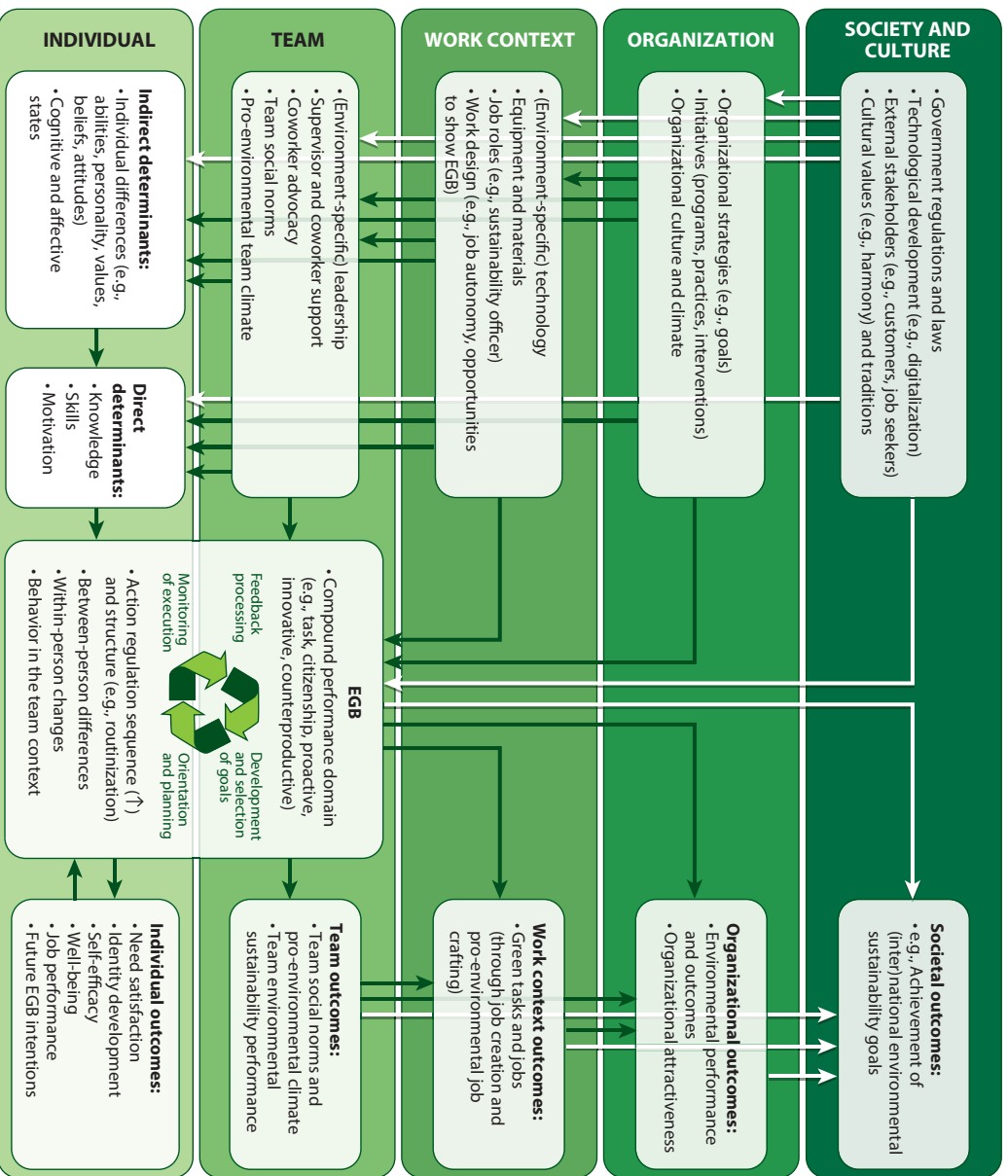
Figure 1

Integrative conceptual model of employee green behavior (EGB) as the core of environmentally sustainable organizations.

knowledge and skills may be more important predictors of task-related EGB, whereas motivation may be more important for more discretionary dimensions of EGB (e.g., citizenship behavior for the environment). Second, consistent with action regulation theory, we suggest that employees psychologically regulate EGB as an active, goal-directed form of work behavior. The action regulation sequence includes developing and selecting relevant (pro-environmental) work goals, orienting oneself in the environment (e.g., resources and constraints regarding goal attainment), planning and monitoring the execution of behavior, and processing feedback (Zacher & Frese 2018). The structure of action regulation entails multiple levels, including the basic sensorimotor or skills level, the level of flexible action patterns (or behavioral routines), the conscious intellectual level, and the level of meta-cognitive heuristics. For instance, we argue that EGB can be routinized through regular practice (e.g., turning off lights in the office) and, thus, "moves" from the intellectual level to the level of flexible action patterns. Finally, **Figure 1** suggests that EGB

can be conceptualized and studied at multiple levels, including the between- and within-person levels and the team level (i.e., aggregate EGB).

According to the model, EGB may be influenced by antecedents at five conceptual levels (see also the early multilevel and multisystem perspective in Starik & Rands 1995). First, consistent with Campbell et al. (1993), we distinguish between three direct (i.e., knowledge, skills, motivation) and various indirect determinants (e.g., stable individual differences, affective and motivational states) at the individual level. These determinants may also include person-related barriers to EGB, such as lack of knowledge or unfavorable pro-environmental attitudes (Yuriev et al. 2018). The indirect individual determinants impact EGB through the three direct determinants. Moreover, the contextual determinants can either directly influence EGB (i.e., if they provide employees with opportunities to perform or represent performance constraints) or indirectly influence EGB through the (indirect and direct) individual determinants. For instance, contextual opportunities for EGB may be high job autonomy and supervisory support, whereas barriers to EGB may include a lack of autonomy and support (Yuriev et al. 2018). Second, at the team level, leader, coworker, and team characteristics, such as environment-specific leadership, coworker advocacy, or team social norms, may influence EGB either directly or via the individual determinants. Third, the work context includes aspects that physically and psychologically facilitate or constrain EGB, either directly or through the team and individual antecedents. For instance, the work context may provide employees with relevant technology or equipment, or enable EGB within specific job roles (e.g., sustainability officers) and the design of work (e.g., job autonomy). Fourth, at the organizational level, environmental strategies, initiatives, culture, and climate may influence EGB directly or through the work context, team, and/or individual level. Finally, factors at the societal and cultural levels, such as government regulations and laws, demands of the external stakeholder(s), or cultural values and traditions, can impact EGB either directly or indirectly through the antecedent factors at the other levels.

The conceptual model further proposes various consequences of EGB at the five levels, including individual (e.g., pro-environmental self-efficacy, identity), team (e.g., team environmental performance), work context (e.g., creation of green tasks or jobs through pro-environmental job crafting), organizational (e.g., organizational attractiveness), and societal (e.g., achievement of environmental sustainability goals) outcomes. Thus, the model suggests that EGB may contribute bottom-up to broader team, work context, organizational, and societal environmental sustainability outcomes, thus potentially creating an environmental competitive advantage at these levels (see Ployhart & Hale 2014). EGB is assumed to influence these outcomes either directly or, with respect to the broader contextual outcomes, indirectly via team, work context, and/or organizational outcomes. For instance, an organization is more likely to meet its environmental sustainability goals when individual team members engage in EGB and, therefore, create a pro-environmental team climate that contributes to higher environmental team performance. Furthermore, certain individual outcomes, such as need satisfaction, environmental self-efficacy, or intentions to engage in EGB in the future, are likely to result in higher subsequent levels of EGB, thus creating a virtuous cycle. For reasons of parsimony, potential interactions between specific antecedents (e.g., affect and attitude; Bissing-Olson et al. 2013) and potential boundary conditions of the effects of EGB on different outcomes are not included in the model and thus could be elaborated in future research.

RECOMMENDATIONS FOR FUTURE RESEARCH

On the basis of our review and integrative conceptual model, we next discuss recommendations for future theory development and methodological improvements.

Theory Development

Our model suggests several directions for theory development. First, research should conceive EGB as an active, goal-directed form of work behavior. On the basis of action regulation theory, future work could explore how employees develop and select work goals related to environmental sustainability. Moreover, the action regulation sequence entails that employees, based on their goals, orient themselves in the environment, plan, monitor the execution of behavior, and process feedback regarding their EGB (Zacher & Frese 2018). Research based on action regulation theory could also explain how employees develop and change positive or negative habits regarding EGB by routinizing or reintellectualizing behavior, respectively. The notions of opportunities for, and barriers to, EGB could be further elaborated from the perspective of action regulation theory, which has distinguished between regulation opportunities (e.g., autonomy, support) and regulation problems (e.g., obstacles, uncertainty, overload).

Second, whereas task-related and proactive EGB, citizenship behavior for the environment, and counterproductive sustainability behaviors have received both theoretical and empirical attention, other potentially important EGB dimensions have been neglected. These include green voice behavior (i.e., speaking up with suggestions regarding environmental sustainability and challenging the status quo), green job crafting behaviors (i.e., proactively incorporating environmental sustainability into one's tasks and work relationships), and green commuting (i.e., traveling to and from work in an environmentally sustainable way). Moreover, whereas several studies have examined effects of environment-specific leadership, further theoretical development and research are needed on the characteristics and behaviors of business founders, managers, and employees involved in green entrepreneurship (Demirel et al. 2019).

Third, conceptualizing EGB as a compound performance domain necessitates that theory development focuses on determinants of EGB that have been established as antecedents of other forms of work performance. In particular, employees' knowledge, skills, and motivation, as well as contextual opportunities and constraints regarding environmental sustainability at work, deserve greater attention as direct determinants of EGB. Moreover, future theoretical work could explain how employees' general mental ability, personality characteristics, attitudes and beliefs, and contextual factors relate to EGB as indirect determinants. In particular, the potential antecedents of counterproductive sustainability behaviors deserve more attention, as research so far has focused only on the role of personality and leadership. Future theorizing should adopt a multilevel perspective by focusing not only on stable individual differences in relevant predictors and EGB but also on within-person changes over time or EGB displayed in team situations (e.g., eco-helping). The propositions of work performance theories (Blumberg & Pringle 1982, Campbell et al. 1993) could be further integrated with prominent social and environmental psychology theories on pro-environmental behavior (e.g., value-belief-norm theory of environmentalism; Stern et al. 1999). Such theoretical integration could also be useful for designing effective interventions that address both individual and contextual antecedents of EGB.

Fourth, the outcomes of EGB for individuals and units at broader contextual levels (i.e., teams, organization, society) need more theoretical attention. It is currently not well understood how individuals react to their own EGB (e.g., with higher pro-environmental self-efficacy or identity, or with environment-related guilt). Moreover, future work needs to explain how employees can help green their work context and organizations (e.g., through pro-environmental voice or job crafting). Teams and organizations can only achieve their environmental sustainability goals when individual employees engage in EGB, such as saving energy or introducing and supporting environmental initiatives (Ones et al. 2018). Further theory development is necessary to better understand the mechanisms underlying the effects of EGB as a psychological microfoundation

on organizational environmental sustainability and, potentially, organizational attractiveness and competitive advantage (Ployhart & Hale 2014).

Fifth, another topic in need of theory development is the potential negative effects of EGB. For instance, given that the enactment of EGB requires time and effort, it may lead to not only positive but also negative individual outcomes, such as environmental citizenship fatigue. Interpersonally, EGB may result in negative reactions from coworkers and supervisors with less favorable pro-environmental attitudes. Similarly, highly qualified job seekers with a low fit in terms of organizational sustainability may decide not to apply. At the team and organizational levels, proactive EGB may lead to problems, as the introduction of environmental initiatives consumes time, effort, and financial resources. Some employees may actively resist certain organizational environmental sustainability initiatives that are perceived to restrict their autonomy (Onkila 2017). Additionally, some employees may not believe in the usefulness of certain environmental sustainability initiatives or may even decide to actively boycott them.

Finally, future theoretical work is needed on cultural differences in EGB and influences of culture on associations between EGB and its antecedents and consequences. For instance, such work could explore how and why employees from different cultural contexts perceive EGB and organizational environmental sustainability differently. Employees in cultures that strongly value economic achievement may be more reluctant to engage in EGB; thus, interventions may need to focus more on motivational aspects. In contrast, employees in cultures that traditionally value living in harmony with the natural environment may not need to be motivated, but could still benefit from interventions that train relevant knowledge, skills, and habits.

Methodological Improvements

Several steps should be taken to improve methodological rigor in future research on EGB. First, scholars should use research designs that fit their research questions and conceptual models. In most cases, cross-sectional survey studies will not be suitable, in particular to examine theories that involve causality (e.g., mediation models) as well as within-person variability and changes over time. We thus encourage researchers in this area to make increased use of experimental and intervention designs, as well as experience sampling, daily diary, and longitudinal studies. When designing intervention studies, researchers should ensure that the intervention group does not receive a treatment that consists of multiple components (e.g., providing information, persuasive communication), as this makes it impossible to disentangle the components' unique effects. Researchers have developed several suggestions to enhance the effectiveness of interventions, such as making the intervention goals attractive and self-concordant (Unsworth et al. 2013). Experience sampling and diary studies allow investigation of within-person variability in EGB, whereas longitudinal studies with three or more measurement waves allow examination of temporal dynamics and testing mechanisms by controlling for baseline effects of mediators and outcomes in the analyses (Bissing-Olson et al. 2015). Moreover, investigating links between EGB and its potential antecedents and consequences may require multilevel designs for which data are collected from individuals nested in teams or organizations.

Second, scholars should avoid collecting data from a single source, particularly self-reports, as this raises concerns about common method bias. Moreover, self-reports of EGB may be biased due to memory flaws and self-enhancement tendencies. Indeed, a meta-analysis on general pro-environmental behavior found only a moderate association between self-reports and objective measures ($r = 0.46$, $k = 19$; Kormos & Gifford 2014). We recommend using combinations of self- and other-reports (e.g., peers, supervisors), as well as objective measures of EGB (see also Young et al. 2015). Given sufficient agreement between employees, individual-level data could also be

aggregated to the team and organizational levels to examine the effects of pro-environmental organizational culture and climate on outcomes at these levels.

Third, studies on EGB should be designed so that they allow comparison of different, potentially competing theoretical explanations and assessment of their relative merits. For instance, studies should include both individual-level (e.g., attitudes, subjective norms) and different contextual predictors (e.g., leadership, HRM practices). Similarly, interactions between such individual and contextual predictors might explain incremental variance in EGB. In this regard, it may also be important to compare unique individual and contextual factors that predict EGB with antecedents of pro-environmental behavior in home or community settings. Future research should also simultaneously consider various antecedents of the six major EGB dimensions (i.e., the green five and counterproductive sustainability behaviors; see **Table 1**) in a single study to distinguish between shared antecedents that predict all EGB dimensions and unique antecedents that have differential effects. Such efforts are important to better understand the differences between EGB dimensions and the specific mechanisms at play for each of them. For instance, it seems likely that general mental ability, conscientiousness, pro-environmental attitudes, and situational opportunities positively predict all of the green five dimensions and negatively predict counterproductive sustainability behaviors (Blumberg & Pringle 1982). In contrast, the availability of environmentally sustainable options to carry out work tasks and a promotion regulatory focus (i.e., a focus on attaining desired outcomes) may constitute unique antecedents of transforming behaviors, whereas accessible equipment and routines may be more relevant for conserving behaviors. Avoiding harm may be uniquely predicted by a prevention regulatory focus (i.e., a focus on avoiding undesirable outcomes), whereas influencing others may be easier for employees with high extraversion and socioemotional skills. A proactive personality and a large social network may be particularly important for taking initiative, and high levels of integrity and low revenge cognitions (e.g., due to psychological contract breach) may help prevent counterproductive sustainability behaviors.

Finally, as Francoeur et al. (2021) suggest, more parsimonious measures of EGB and its distinct dimensions should be (re)developed using factor analysis. Instead of developing additional ad hoc survey measures, researchers should collect further evidence for the reliability and construct validity of these dimensions. The green six, including Ones & Dilchert's (2012a) green five dimensions and counterproductive sustainability behaviors (see **Table 1**), represent a useful starting point to integrate a broad variety of more specific EGBs.

PRACTICAL RECOMMENDATIONS

In this final section, we outline several practical recommendations for employees, leaders, and organizations interested in becoming more environmentally sustainable (see **Supplemental Figure 2** for a summary of 20 recommendations).

Employees

Individuals interested in showing and further improving their EGB at work should seek out organizations, teams, and jobs that provide them with opportunities to enact such behaviors and that make active attempts to reduce person-related and contextual barriers to EGB (e.g., lack of awareness about environmental problems, lack of support, nongreen organizational culture). Additionally, they should focus on enhancing their relevant knowledge, skills, and motivation. For example, they could inform themselves about the environmental sustainability strategy and initiatives of their organization, participate in green training, set themselves environmental sustainability goals, and develop corresponding positive habits. Furthermore, they could voice suggestions or craft their jobs to create opportunities and reduce constraints for showing EGB.

Leaders

Leaders should act as role models for EGB and use persuasive communication to convince employees of the individual, organizational, and societal benefits of EGB. Leaders can also physically facilitate EGB and implement green HRM practices in their area of responsibility (e.g., recruiting and selecting team members with a favorable pro-environmental attitude, EGB as part of performance appraisal and management, distribution of incentives based on EGB). Finally, leaders could use psychological influence techniques for increasing EGB, such as providing comparative information and performance feedback (Unsworth et al. 2013), and they could support employees' attempts to reduce counterproductive sustainability behaviors (Paillé et al. 2019a).

Human Resource Management

Organizations can implement several green HRM practices to encourage EGB and reduce counterproductive sustainability behavior (Tang et al. 2018). First, they should incorporate environmental sustainability goals into their business strategy and performance metrics; the existence of a sustainability policy has been shown to positively affect EGB (Norton et al. 2014). Moreover, an environmental sustainability strategy can help create a pro-environmental public image of the organization to attract and recruit job seekers with corresponding values. Organizations should thus mention sustainability in recruiting materials, train recruiters to highlight green values and initiatives, and target job seekers with green values and knowledge (Pham & Paillé 2020). Indeed, a study showed that job seekers with a more favorable pro-environmental attitude were more attracted to organizations with high environmental performance, whereas economic company performance was less important to these job seekers (Bohlmann et al. 2018a). Building on such green recruitment efforts, organizations should develop and use personnel selection tools to assess or predict EGB (Pham & Paillé 2020).

Second, organizations should use green onboarding, organizational socialization, and personnel development practices, including green training that addresses pro-environmental aspects of core tasks and more discretionary work behaviors. Furthermore, a pro-environmental organizational culture and climate can be created by stressing green values and by implementing corresponding policies, practices, and procedures in business operations. These efforts should be supplemented by offering specialized training for leaders and upper management.

The work context should be designed to facilitate EGB (e.g., include green tasks in job descriptions; making EGB convenient through physical facilitation, such as putting up recycling bins). Additionally, EGB could be facilitated through green performance management (i.e., setting green performance goals; training supervisors to evaluate EGB, to praise positive behaviors, and to reprimand counterproductive sustainability behaviors), through green compensation and reward structures (Young et al. 2015), and by offering developmental work assignments and career paths related to environmental sustainability (e.g., sustainability officers, green multipliers in teams). Finally, organizations should use interventions to motivate employees to continuously show EGB and to avoid counterproductive sustainability behavior. To this end, the most effective interventions make use of information campaigns to increase environmental awareness and feedback at the individual and group levels (Davis et al. 2020, Unsworth et al. 2013).

CONCLUSION

EGB is an emerging and important performance construct that has attracted increased attention from organizational researchers and practitioners over the past two decades. Numerous published

studies—mostly using single-source data from cross-sectional surveys—have examined potential antecedents of various forms of EGB. To mature as a research field, research on EGB needs to (*a*) conceptualize and assess EGB as a compound performance domain with multiple distinct performance dimensions that are psychologically regulated, (*b*) test theoretical models that frame EGB as a form of employee performance that contributes to (or detracts from) organizational environmental objectives, (*c*) use more rigorous research designs, such as experiments, as well as longitudinal and experience sampling studies, and (*d*) focus on multiple levels of both antecedents and outcomes, including direct and indirect individual determinants and individual outcomes, as well as team, work context, organizational, and broader societal and cultural factors. We hope that our integrative conceptual model, as well as the recommendations for theory development, methodological improvements, and future empirical studies will serve as useful guidelines for the next decades of research on EGB as the core of organizational environmental sustainability.

SUMMARY POINTS

1. Employee green behavior (EGB) is a compound performance domain that comprises a set of measurable employee actions that are linked with and contribute to or detract from environmental sustainability.

2. The green five taxonomy includes five broad EGB dimensions (i.e., transforming, conserving, avoiding harm, influencing others, taking initiative) that can be supplemented with counterproductive sustainability behaviors as a sixth dimension.

3. EGB can be classified along three continuous dimensions, including in-role (i.e., as part of employees' core tasks) versus extra-role (i.e., discretionary behavior as an organizational citizen), direct (i.e., employees themselves benefitting or harming the environment) versus indirect (i.e., employees encouraging others at work to show EGB), and low intensity (i.e., involving less effort, lower risk, more incremental) versus high intensity (i.e., involving higher effort and risk, more radical).

4. Prominent social and environmental psychology theories that have been used to study EGB include the theory of planned behavior, norm-activation theory, the value-belief-norm theory of environmentalism, the social identity approach, and social exchange theory.

5. Conceptual models of EGB include the comprehensive action determination model of sustainable behavior in companies, the model of multilevel influences on pro-environmental motivation and EGB, and the process framework of macrodeterminants of EGB.

6. Most empirical studies on EGB have used cross-sectional research designs and archival data and/or self-report measures, but a growing number of studies uses more rigorous daily diary study and longitudinal designs, as well as experimental and intervention designs.

7. Empirical studies have examined individual antecedents, including stable between-person differences (e.g., attitudes, personality) and more dynamic within-person phenomena (e.g., affective and motivational states), as well as contextual antecedents, including work context characteristics, leadership and supervisor support, coworkers and team characteristics, organizational factors, and societal and cultural characteristics.

8. On the basis of action regulation theory, EGB can be conceptualized as an active, goal-directed form of work behavior that needs to be psychologically regulated (e.g., goal development and selection, planning, monitoring of execution, processing of feedback) at different regulatory levels (e.g., flexible action patterns or routines, conscious intellectual level).

FUTURE ISSUES

1. Future theoretical and empirical research based on action regulation theory could explore how employees proactively and effectively regulate their EGB and how they develop and change positive or negative habits regarding EGB.

2. Future research should examine predictors of established forms of work performance as direct determinants of EGB, including employees' knowledge, skills, and motivation, as well as contextual opportunities and constraints regarding EGB.

3. Future research could explore the nomological network of neglected EGB dimensions, such as green voice behavior, green job crafting behaviors, and green commuting, as well as their associations with task-related and proactive EGB, organizational citizenship behavior for the environment, and counterproductive sustainability behaviors.

4. Further theoretical development and research are needed on EGB at higher organizational ranks (e.g., CEOs), as well as the characteristics and pro-environmental behaviors of business founders, managers, and employees involved in green entrepreneurship.

5. Future research on EGB should adopt a multilevel perspective that includes not only stable individual differences in relevant individual predictors but also predictors (and their interactions) at the within-person (e.g., affective and motivational states) and contextual levels (i.e., team, work context, organization, society and cultural characteristics).

6. Propositions of work performance theories could further be integrated with social and environmental psychology theories on pro-environmental behavior (e.g., theory of planned behavior, value-belief-norm theory of environmentalism) to better understand EGB.

7. The outcomes of EGB for individuals (e.g., well-being, performance, pro-environmental self-efficacy and identity) and units at higher conceptual levels (e.g., pro-environmental climate and environmental performance at the team and organizational levels) need more theoretical and empirical attention.

8. Future theory development and research could explore potential negative effects of high or low levels of EGB for individuals (e.g., citizenship fatigue, poor person–organization fit), teams (e.g., erosion of social norms, social conflicts), and organizations (e.g., low levels of organizational attractiveness, resistance to change).

DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

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Contents

Errata

An online log of corrections to *Annual Review of Organizational Psychology and
Organizational Behavior* articles may be found at http://www.annualreviews.org/
errata/orgpsych