

**Antecedents and Consequences of Conspicuous Green Behavior on Social Media: Incorporating the Virtual Self-identity into the Theory of Planned Behavior**

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## **Highlights**

- Posting about green behaviour on Instagram is investigated as Conspicuous Green Behavior (CGB)
- Normative influences inform CGB.
- ‘Darker’ influences including narcissism and deceptive Like-Seeking also inform CGB.
- CGB is incorporated into the Theory of Planned Behaviour as a virtual self-identity.
- CGB informs both intention and pro-environmental behaviors (PEBs).

## **Antecedents and Consequences of Conspicuous Green Behavior on Social Media: Incorporating the Virtual Self-identity into the Theory of Planned Behavior**

Researchers advocate incorporating self-identity into the Theory of Planned Behavior for studies investigating pro-environmental behaviors (PEBs). Although social media facilitates a virtual self-identity construction, surprisingly few, if any, studies investigate virtual self-identity as a determinant of PEBs. This study introduces ‘conspicuous green behavior’ (CGB) to explain social media posts about climate change which convey a pro-environmental virtual self-identity. We integrate CGB into the Theory of Planned Behavior and investigate the relationship between CGB and pro-environmental intention and behavior. We propose subjective norms, Like-seeking and narcissism as antecedents of CGB. Using survey design, data from a sample of 436 Instagram users in the United States were analyzed using partial least squares structural equation modeling (PLS-SEM). Findings show subjective norms, Like-seeking and narcissism influence CGB. Furthermore, CGB has positive associations with individuals’ pro-environmental intentions and behaviors, particularly more conspicuous behaviors. We discuss the implications of these new contributions for theory and practice.

**Keywords:** Conspicuous Green Behavior, Theory of Planned Behavior, Narcissism, Like-Seeking, Pro-Environmental Behaviors.

## **1. Introduction**

Pro-environmental behaviors (PEBs), which include acts that benefit the natural environment (e.g., recycling) or reduce the harm to it (e.g., minimizing air travel) (Lange & Dewitte, 2019), mitigate and prevent environmental threats, such as climate change, pollution and changes in biodiversity. For this reason, research has sought to understand PEBs and the factors that induce adoption of these behaviors (Lange, 2022; Li et al., 2019; Milfont et al., 2019).

The Theory of Planned Behavior (TPB) (Ajzen, 1988, 1991) has been applied to understand why people engage in PEBs (e.g., Alzubaidi et al., 2021; Ateş, 2020; Clark et al., 2019; Yuriev et al., 2020). Extant research has also advocated that the explanatory power of the TPB would be increased if it incorporated self-identity (Shaw et al., 2000; Smith et al., 2007), because behaviors associated with being a ‘green consumer’ are linked to self-identity (Sparks & Shepherd, 1992). Whitmarsh and O’Neill (2010), for instance, found that self-identity was an important determinant of some PEBs. More recently, the predictive role of self-identity as ‘green consumers’ was found in the case of organic food consumption (Carfora et al., 2019) and the purchase of eco- or sustainability-labelled products (Ateş, 2021; Chen, 2020).

This study extends extant research by incorporating the presentation of the self on social media, that is, virtual self-identity (Lee & Borah, 2020), into the TPB, to explore its effect on pro-environmental intentions and behaviors. This exploration is important because social media is a vehicle for self-identity construction and a means to present an extended self (Belk, 2013). The presentation of the online self may be, however, unrelated to ones’ material reality (Schau & Gilly, 2003). Social media posts can be a conspicuous display of a virtual, idealised self (Hollenbeck & Kaikati, 2012). Consequently, social media research has investigated self-presentation on social media (Dumas et al., 2017; Sheldon & Bryant, 2016) and the relationship between virtual self-

identity and offline behaviors (Wallace et al., 2017). Yet, in the context of prosocial behaviors, few studies have explored social media posts as a form of virtue signaling. A recent exception is Wallace et al. (2020), which found that when social media posts about charities are intended to virtue signal, they are not associated with offline prosocial behaviors. Their research is informed by the concept of conspicuous donation behavior, which is defined as “the act of donating to charitable causes via the visible display of charitable merchandise or the public recognition of the donation” (Grace & Griffin, 2009, p. 16).

Building on this concept, we propose the term ‘conspicuous green behavior’ (CGB), which we define as “an individual’s visible show of support for green behaviors through their social media posts about climate change that may or may not be associated with offline green behaviors”. Central to this definition are the following aspects: i) the social media post is about climate change; ii) the individual posting about climate change on social media may or may not engage in any green behavior offline; iii) when the individual posts about climate change on social media, they are aware that their posts conspicuously display a virtual self-identity; and iv) the individual’s motive for posting about climate change may be public recognition and virtue signaling.

Social media has been explored as a channel to influence or encourage PEBs. Recent research has analyzed, for instance, the role of social media in promoting sustainable purchasing attitudes (Zafar et al., 2021), reducing consumers’ food waste (Young et al., 2017) and increasing recycling behaviors (de Fano et al., 2022; Sujata et al., 2019). Surprisingly, to the authors’ knowledge, no studies have investigated whether consumers that post about climate change on social media engage in PEBs offline. Therefore, this study seeks to answer the following research question: Can social media posts about climate change help us to understand individuals’ PEBs, through integrating CGB as a form of virtual self-identity into the TPB?

Drawing on the TPB and research on self-identity (Shaw et al., 2000; Smith et al., 2007), we present a new model proposing CGB as a form of virtual self-identity and we explore the relationship between CGB and pro-environmental intentions and behaviors of social media users. As we assert that CGB can be a form of virtue signaling, in line with research investigating self-enhancement on social media (Dumas et al., 2017), we also examine subjective norms, normative and deceptive Like-seeking, and narcissism as antecedents of CGB.

The paper offers several important contributions. First, we add to knowledge about the TPB, integrating self-identity into TPB by investigating its relationship to pro-environmental intentions and behaviors. Second, we present the concept of CGB and show that individuals who engage in CGB engage in a different way with PEBs. Our findings suggest that some PEBs (e.g., political actions) are more consistent with conspicuous consumption and an expression of identity than others (e.g., waste reduction). Third, we show that CGB is influenced by subjective norms and normative Like-seeking, and also by narcissism and deceptive Like-seeking, thereby showing that CGB has normative and ‘darker’ self-enhancing motives. Finally, the study broadens understanding of CGB on Instagram. Drawing on our findings, we also advocate considering climate change posts as a form of conspicuous consumption to inform behavioral change strategies and persuasive messaging, and encourage more engagement in PEBs.

The paper is organized as follows. The next section describes the TPB, introduces CGB as a form of virtual self-identity, and provides theoretical support for our hypotheses. In section 3, the methodology utilized to recruit a sample of 436 Instagram users in the United States is outlined. Section 4 presents the analysis of the data and the hypotheses tests, which we undertook using PLS-SEM. In section 5, we discuss our findings in relation to the literature, offer academic and managerial implications and we present limitations and recommendations for further research.

## **2. Conceptual Framework and Research Hypotheses**

Figure 1 presents the conceptual framework. It builds on extant literature that proposes identity as an important extension of the TPB in the context of PEBs (Whitmarsh & O’Neill, 2010). It also considers the potential disconnect between online self-presentation and offline behavior (Belk, 2013; Hollenbeck & Kaikati, 2012), by proposing the term conspicuous green behavior (henceforth CGB). As explained earlier, CGB refers to posts that support green behaviors and are overtly displayed on social media but may not be associated with offline green behaviors.

Specifically, we investigate whether subjective norms influence CGB, and we explore CGB as an antecedent of pro-environmental intentions and behaviors. As we posit that CGB can be merely a form of virtual virtue signaling, we also investigate Like-seeking behaviors and narcissism as antecedents of CGB. We describe the relationships between the variables in detail next, opening with an explanation of TPB in general, and in the context of PEBs in particular.

< Figure 1 about here >

### ***2.1 Theory of Planned Behavior and Pro-Environmental Behaviors***

The Theory of Planned Behavior (TPB) (Ajzen, 1988, 1991) is one of the most widely used frameworks for exploring individual behavior (Yuriev et al., 2020). The TPB asserts that behaviors come from intention. Intention is defined as “indicators of how hard people are willing to try to perform the behavior” (Ajzen, 1991, p. 181). These intentions are in turn influenced by three independent dimensions: attitude toward a behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). Attitude toward a behavior is “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen, 1991, p. 188). Subjective norms are “the perceived social pressure to perform or not to perform the behavior”

(Ajzen, 1991, p. 188). Finally, perceived behavioral control relates to “people’s perception of the ease or difficulty of performing the behavior of interest” (Ajzen, 1991, p. 183).

Since its development over thirty years ago, the TPB has been frequently used as a central framework to understand the factors leading to PEBs (Yuriev et al., 2020). Extant research on pro-environmental and related behaviors have supported the positive associations of perceived behavioral control, attitude, and subjective norms on intention, for example in studies on energy conservation (Muñoz et al., 2016), intention toward collaborative consumption (Roos & Hahn, 2019), travelers’ intention toward PEB in green hotels (Han, 2015), consumer recycling intention (Botetzagias et al., 2015; Chan & Bishop, 2013), and even some intentions toward PEB in the workplace (Greaves et al., 2013). Therefore, drawing on the components of the TPB (Ajzen, 1991), we first investigate these indicators as antecedents of intention, and we hypothesize:

***H1.** Perceived behavioral control is positively associated with intention to engage in pro-environmental behaviors.*

***H2.** Attitude is positively associated with intention to engage in pro-environmental behaviors.*

***H3.** Subjective norms are positively associated with intention to engage in pro-environmental behaviors.*

In line with the TPB, intention is hypothesized to predict behavior (Ajzen, 1991). As noted earlier, PEBs include a wide range of behaviors that benefit the natural environment, improve environmental quality, or minimize the harm to the environment (Larson et al., 2015). As PEBs encompass numerous aspects (Stern, 2011), over the past decades, researchers have focused on different behaviors (e.g., waste reduction, energy conservation, recycling, water conservation, eco-friendly purchasing, environmentally conscious transportation, environmental citizenship, political



consciousness) and have operationalized the PEB construct in multiple ways. For instance, Markle's (2013) conceptualization of PEB includes four categories: conservation, environmental citizenship, food and transportation. Similarly, Larson et al. (2015) identify four elements: conservation lifestyle behaviors, social environmentalism, environmental citizenship and land stewardship. In their study focused on examining the relevance of self-identity in predicting PEBs, Whitmarsh and O'Neill (2010) propose similar categories, such as waste reduction, eco-shopping and eating, regular water and domestic energy conservation actions, eco-driving, reducing car use and flights, and political actions.

Based on commonalities in prior literature and drawing on Whitmarsh and O'Neill's (2010) work, five categories of PEBs were explored in the current study: eco-driving/transport actions, eco-shopping and eating, waste behavior, conservation, and political actions. Eco-driving/transport actions include driving/using more energy efficient vehicles or using the car less and seeking alternatives for short trips; eco-shopping and eating choices include buying products that are more energy-efficient or eating food locally in season; waste reduction actions include increasing recycling and wasting less; conservation actions include more responsible water usage; and political actions include behaviors such as taking part in protests about environmental issues.

The relationship between intention and behavior has been investigated in the extant literature on PEBs (e.g., Alzubaidi et al., 2021; Greaves et al., 2013). In earlier research, intention was found to be associated with eco-driving (Lauper et al., 2014), organic food purchasing (Ham et al., 2018), and waste reduction (Graham-Rowe et al., 2015). From a conservation perspective, intention was also associated with energy-saving behavior (Liu et al., 2021) and with engaging in environmental activism such as protesting or lobbying government (Fielding et al., 2008). Moreover, extant studies investigate intention as an antecedent of several PEBs; for example,

intention is investigated as an overarching antecedent of indirect and direct PEBs (Alzubaidi et al., 2021), and of subdivisions of PEBs (Fielding et al., 2008). Therefore, in line with extant literature (e.g., Fielding et al., 2008) and in response to the calls for further research examining how different PEBs are influenced (Larson et al., 2015), we investigate whether intention to engage in PEBs will be positively associated with each of the PEBs categories. We hypothesize:

**H4.** *Intention to engage in pro-environmental behaviors is positively associated with pro-environmental behaviors: a) eco-driving/transport actions, b) eco-shopping and eating, c) waste reduction, d) conservation, and e) political actions.*

The relationship between intention and behavior can be moderated by perceived behavioral control. The TPB suggests that “people are expected to be able to act on their intentions to the extent that they have control over performance of the behavior” (Ajzen, 2020, p. 316). Given that measuring individuals’ actual control over behavior is difficult, perceived behavioral control is usually employed as a proxy for actual control (Ajzen, 2020). According to the TPB, the intention-behavior relation will be stronger when perceived behavioral control is high than when it is low (Ajzen, 2020). Although rarely tested, previous studies investigating the interaction effect of perceived behavioral control and intention on behavior have reported significant moderating effects (e.g., Hagger et al., 2022; Steinmetz et al., 2011). Thus, we propose:

**H5.** *Perceived behavioral control moderates the influence of intention to engage in pro-environmental behaviors on pro-environmental behaviors: a) eco-driving/transport actions, b) eco-shopping and eating, c) waste reduction, d) conservation, and e) political actions.*

## ***2.2 Theory of Planned Behavior and Virtual Self-Identity: Conspicuous Green Behavior***

An advantage of the TPB is its flexible structure, as scholars have historically expanded this theory by adding variables (Yuriev et al., 2020), such as the concept of self-identity (Sparks & Shepherd, 1992; Mannetti et al., 2004; Whitmarsh & O'Neill, 2010). Self-identity is the way one defines oneself, influenced by personal motivations, social interaction and self-performed roles (Whitmarsh & O'Neill, 2010). This construct has been found to predict behavior over and above the TPB in relation to PEBs (Sparks & Shepherd, 1992; Whitmarsh & O'Neill, 2010). If someone sees themselves in the role of a green consumer, they may adopt more PEBs, particularly repeated behaviors (Charng et al., 1988). Similarly, if one identifies with the 'prototype' of person who performs PEBs, they may engage in behaviors that are associated with that image (Mannetti et al., 2004). Recent research also suggests that identity may more strongly predict PEBs when those behaviors are visible to others and green behaviors may signal group membership through being 'green to be seen' (Brick et al., 2017).

In the current study, we expand on this identity-behavior research, as we investigate whether virtual self-identity, in the form of self-presentation on social media, informs the TPB and influences PEBs. Virtual self-identity is theoretically different to self-identity because virtual self-identity may not always be the same as one's reality, as online posts can be substantially different from actual behaviors (Belk, 2013; Hollenbeck & Kaikati, 2012; Schau & Gilly, 2003). On social media individuals can maintain or enhance a self-identity with very little effort (Hollenbeck & Kaikati, 2012). Moreover, virtual self-identity can present an extended self (Belk, 2013), which may be self-promotion (Dumas et al., 2017) through a curated, idealized self (Hollenbeck & Kaikati, 2012). Such social media posts become part of the virtual self (Belk, 2013). For example, cognizant that Likes are conspicuous, one may avoid Liking certain political parties on social

media, to avoid a negative portrayal of the self (Marder et al., 2018). On the other hand, individuals may post about a desirable good on social media for the purpose of self-enhancement, without any requirement to own that good in the real world (Schau & Gilly, 2003).

In this context, we propose the concept of conspicuous green behavior (CGB) to describe posts about climate change on social media, which are an intentionally visible display, that are designed to achieve public recognition. This definition is in line with Grace and Griffin's (2006, 2009) conceptualization of other-oriented conspicuous donation behavior, which is "overt donation behavior that is motivated by the desire to display the behavior to others" (Grace & Griffin, 2009, p. 22). In the offline world, 'green to be seen' behavior (Brick et al., 2017) can be considered a form of conspicuous behavior. However, although 'green to be seen' behavior is conspicuous, the individual is also engaging in PEB. For example, although carrying a recycled bag may be a conspicuous act, the consumer has already purchased the bag (Brick et al., 2017). By contrast, on social media, one can present a virtual self which is entirely different to ones' material reality (Schau & Gilly, 2003). Therefore, our conceptualization of CGB offers new insights into the relationship between the virtual self, identity and PEB, as online posts may not be associated with offline behavior. We next present hypotheses to explore antecedents and consequences of CGB.

#### *Antecedents of Conspicuous Green Behavior: Subjective Norms, Like-seeking and Narcissism*

We first consider the relationship between subjective norms and CGB. Subjective norms refer to the perceived social pressure from important referents to perform or not to perform a behavior (Ajzen, 1991). Grace and Griffin (2009) advocated that ones' regulation of behavior to accommodate social situations should be considered in investigations of conspicuous donation behavior. Subjective norms are also associated with users' behavioral intentions towards Internet

use (Jiang et al., 2016). Therefore, subjective norms have relevance for our study of CGB. Cognizant that subjective norms may have a stronger influence when individuals are concerned about the opinions of others (Dixon et al., 2015), we investigate whether subjective norms may be associated with individuals posting about climate change on social media, when their intention is to display that behavior to others and to achieve recognition for that behavior. We hypothesize:

***H6. Subjective norms are positively associated with Conspicuous Green Behavior.***

To further develop our conceptualization of CGB, we investigate Like-seeking as an antecedent. Like-seeking is considered as a form of validation and attention from online sources (Dumas et al., 2017). When posting on social media, individuals receive ‘feedback’ from others, and they are motivated to post to seek approval from followers through Likes (Jackson & Luchner, 2018). Users of social media may be so focused on validation or attention through Likes, that they even engage in manipulative behaviors to attain more Likes (Dumas et al., 2017). Specifically, Dumas et al. (2017, p. 7) distinguish between normative Like-seeking behaviors (e.g., uploading a picture), which involve actions “widely accepted” among individuals, and deceptive Like-seeking behaviors which involve “less normative, and more dishonest actions to secure Instagram Likes (e.g., buying likes/followers)”.

Cognizant of this need for validation and attention, one way for individuals to attain Likes is to signal good deeds to others through social media posts (Wallace et al., 2020). Considering the possibility that individuals may seek to attain Likes through their posts on social media (Dumas et al., 2017), and CGB may offer a means to virtue-signal on social media, we contend that individuals engaging in CGB may have Like-seeking motives. Investigating both normative Like-seeking and deceptive Like-seeking, in line with Dumas et al. (2017, 2020), we hypothesize:

*H7. Normative Like-seeking behavior is positively associated with Conspicuous Green Behavior.*

*H8. Deceptive Like-seeking behavior is positively associated with Conspicuous Green Behavior.*

The study also investigates narcissism as an antecedent of CGB. Extant research suggests it could seem a “counter-intuitive proposition” to consider an association between narcissism and green behaviors, as narcissists do not intrinsically value green behavior or their benefits for society (Naderi & Strutton, 2014, p. 375). Yet narcissism is associated with conspicuous consumption (Neave et al., 2020). Naderi and Strutton (2014) also advocated motivating PEBs by aligning green goals with narcissistic goals, as narcissists may engage in green behaviors which have conspicuous signaling value.

On social media, narcissism is a salient and consistent predictor of activity levels, including sharing of materials to promote the self (Sheldon & Bryant, 2016), as well as extensive presentation to the largest possible audience (Ong et al., 2011). As our research considers the virtual self-identity, and as our conceptualization of CGB involves social media posts that are both public and intended to achieve recognition, we investigate narcissism as an antecedent of CGB. We hypothesize:

*H9. Narcissism is positively associated with Conspicuous Green Behavior.*

#### *Conspicuous Green Behavior, Intention, and Pro-Environmental Behavior*

Finally, the study seeks to add insights to the TPB, by investigating the relationship between CGB and intention as well as actual PEBs. Extant research on TPB and self-identity has tended to consider self-identity as an antecedent of intention rather than behavior (Smith et al., 2007), while other studies have considered self-identity as an antecedent of PEB (e.g., Whitmarsh & O’Neill,

2010). In the context of PEBS, Yuriev et al. (2020) advocate further research to consider a potential intention-behavior gap, cautioning that scholars focus on antecedents of intention, rather than those that influence behavior. In general, they argue, TPB is used to measure the intention to behave in a pro-environmental way, rather than measuring behavior. Therefore, we investigate the relationship between CGB on social media and both pro-environmental intentions and behaviors.

In their research on conspicuous donation behavior, Grace and Griffin (2009) advocated further investigation of the relationship between this construct and behavioral consequences such as loyalty or intentions. As explained earlier, CGB, which involves posts on social media, is different to offline self-identity. We assert that CGB is negatively associated with pro-environmental intentions or behaviors, in line with concerns voiced in literature observing disparities between social media posts and offline behaviors (for example see Hollenbeck & Kaikati, 2012; Schau & Gilly, 2003; Wallace et al., 2020). Our hypotheses also have support from previous research on virtual signaling behavior on social media which revealed a negative relationship between this form of signaling on social media and real-world altruistic intentions and behaviors, in the context of the charity sector (Wallace et al., 2020). Building on this nascent research we posit and test a negative relationship between CGB and intention and between CGB and PEBS:

***H10.*** *Conspicuous Green Behavior is negatively associated with intention to engage in pro-environmental behaviors.*

***H11.*** *Conspicuous Green Behavior is negatively associated with pro-environmental behaviors: a) eco-driving/transport actions, b) eco-shopping and eating, c) waste reduction, d) conservation, and e) political actions.*

### **3. Method**

#### ***3.1 Participants and procedure***

The research methodology was quantitative, based on an online questionnaire prepared using Qualtrics software and distributed as a Human Intelligence Task (HIT) via Amazon's Mechanical Turk (MTurk). MTurk is an online marketplace where people sign up to take part in tasks such as online sampling for research purposes (<http://mturk.com>). The use of MTurk has increased by 2,117% in recent years due to its many advantages (Aguinis et al., 2020) such as the reliability and comparability of its samples to traditional samples (e.g., Hauser & Schwarz, 2016; Hunt & Scheetz, 2019) and the ability to recruit a large and diverse participant pool (Aguinis et al., 2020). In addition, MTurk provides ease of access to data and speedy data collection, and it is relatively cost-effective (Buhrmester et al., 2018). Furthermore, there is evidence that data from MTurk are as reliable as data from other traditional methods (Buhrmester et al., 2011). Most important for this study, MTurk data have already been used in earlier studies of PEBs (e.g., Ertz et al., 2016).

Following a pilot test designed to ensure that instructions were clear and to monitor and rectify issues with data quality (Aguinis et al., 2021), MTurk workers (those who sign up to take part in HITs) were invited to participate in the survey. This study specifically sought to investigate the attitudes and PEBs of individuals who had made posts about climate change on the Instagram social network. With roughly one billion monthly active users (Statista, 2021), Instagram is based more on one's personal identity rather than on one's relational identity (Sheldon & Bryant, 2016). In addition, Instagram is more focused on self-presentation and self-promotion than other social networks (Dumas et al., 2017). Therefore, Instagram was deemed the most appropriate social network for our study of CGB and virtual self-identity.



To take part in the study, participants were asked two screening questions: i) whether they had an Instagram account, accessed in the previous month, and ii) whether they had posted about climate change on Instagram in the past six months. In addition, in line with best-practice recommendations to only use highly qualified MTurk workers (Aguinis et al., 2021), only MTurk users with an approval rating higher than, or equal to, 95% on previous tasks were allowed to take part in the study. A general adult sample of 521 individuals who met all of these criteria were recruited and allowed to complete the survey.

A limitation of MTurk is perceived researcher unfairness, with concerns about inaccurately stated time requirements or fairness of procedures to make compensation decisions (Aguinis et al., 2021). Therefore, workers were advised in the introduction to the study that the survey would take 17 minutes to complete, and that they would be paid \$1.70 for completion of the survey. This payment rate is equivalent to \$6 per hour, which is a ‘good’ rate advised by MTurk. Moreover, payment for completed responses was approved within 24 hours of survey completion, in line with best practice (Aguinis et al., 2021).

MTurker inattention is also a challenge, as participants can be distracted by web surfing, mobile phone scrolling, or by other people (Barends & de Vries, 2019). Therefore, to avoid careless responses, to prevent worker inattention, and to support internal reliability and validity, we included an attention check in the questionnaire (Meade & Craig, 2012). Only data from those participants who correctly performed the attention check, as well as those who completed the survey at a reasonable length of time, were used. These checks resulted in 436 participants. This sample size is consistent with samples in previous research of Instagram users (e.g., Dumas et al., 2017; Sheldon et al., 2017; Sheldon & Bryant, 2016), and it is also in line with sample sizes in studies about Instagram and pro-environmental attitudes (e.g., Lee, 2022).

Table 1 provides an overview of sample characteristics. 64.7% of respondents were male and the mean age was 33.67 years. Most participants worked full time outside the home (89%), and 54.4% held an Undergraduate Degree or Diploma. 15.4% of participants had up to 100 followers on Instagram and 20.9% had between 101 and 300 followers. 41.3% spent up to one hour on Instagram daily.

< Table 1 about here >

### ***3.2 Measures***

Well-established scales, grounded in extant literature, were employed to measure the constructs in this study (see Appendix).

TPB constructs were measured using the scales by Ajzen (1991, 2006) on 7-point Likert scales (1 = strongly disagree, 7 = strongly agree), except attitude which was measured with 6 bipolar 7-point scales. Sample items included: “I feel that I am able to make changes to my lifestyle to adopt pro-environment actions” (perceived behavioral control); “Thinking about the pro-environment behaviors you might make, do you think those actions would be unpleasant/pleasant?” (attitude); “The people in my life whose opinion I value would think that I should take pro-environment actions” (subjective norms), and “I will try to take one or more pro-environment actions in the forthcoming month” (intention).

Instagram Like-seeking behavior was measured using the 11-item scale by Dumas et al. (2017). Items such as “uploaded a picture at a certain time of day” measured normative Like-seeking behavior, and items such as “purchased Likes” measured deceptive Like-seeking behavior, using a 5-point scale (1 = never, 5 = nearly always).

Narcissism was measured using the Hypersensitive Narcissism scale by Hendin and Cheek (1997), which measures vulnerable narcissism. Vulnerable narcissism is the more prevalent form of narcissism among younger age cohorts, including millennials (Neave et al., 2020), and was therefore of specific interest to a study of Instagram users, as two thirds of its users are aged under 35 years (Statista, 2021). Participants rated their level of agreement on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) to statements such as “I dislike being with a group unless I know I am appreciated by at least one of those present”.

Conspicuous Green Behavior (CGB) was measured using 5 items adapted from Grace and Griffin’s (2009) scale for other-oriented conspicuous donation behavior. The items were measured on a 7-point Likert scale (1 = strongly agree, 7 = strongly disagree) and included the following: “I like to mention climate change on Instagram because it makes me look good”.

Pro-Environmental Behavior (PEB) was measured using 17 items proposed by Whitmarsh and O’Neill (2010). Participants were asked to indicate how often they currently undertake behaviors, measured on a 5-point scale (1 = never, 5 = nearly always). Based on prior research and Whitmarsh and O’Neill’s (2010) work, behaviors from five categories were included: eco-driving/transport actions, eco-shopping and eating, waste behavior, conservation, and political actions. Self-reported behaviors were used in line with other works, such as de Leeuw et al. (2015), who argue that self-reports are preferable due to the impossibility of attaining objective measures for such a wide range of behaviors and are comparable with most other studies of PEB. Furthermore, to counter order effects of measures of intention to engage in PEBs and actual PEBs, a gap between these measures was included in the questionnaire, in line with recent studies (Singh et al., 2020).

The study also investigated several controls, common to studies of TPB and pro-environmental consumption (e.g., Roos & Hahn, 2019). Therefore, we included gender, age, education, number of children, and whether the respondent lived in a large city or smaller town.

### ***3.3 Common method bias***

Common method bias was assessed using both procedural and statistical procedures (Podsakoff et al., 2003). First, procedural remedies proposed by Podsakoff et al. (2003) were applied at the research design stage. In particular, to ensure respondents gave honest and non-artificial responses, participation in the research was voluntary and confidentiality and anonymity were assured. In addition, to prevent the participants from inferring cause-effect relationships, the variables were introduced on different pages of the online questionnaire. Regarding the statistical procedures, the well-established method based on full collinearity tests proposed by Kock and Lynn (2012) and tested in Kock (2015) was carried out. This is a conservative and effective alternative for identifying common method bias (Kock, 2015). Through the procedure proposed, variance inflation factors (VIFs) are generated for all latent variables in the model. Then, VIFs are examined. As posited by Kock (2015, p. 7), “if all VIFs resulting from a full collinearity test are equal to or lower than 3.3, the model can be considered free of common method bias”. In the proposed model, the higher VIF value was of 2.36, lower than the 3.3 threshold. Therefore, common method bias does not appear to be a significant problem in this research.

### ***3.4 Data analysis***

The hypotheses were tested using partial least squares (PLS) structural equation modeling with SmartPLS 3.0 (Ringle et al., 2015). The use of PLS is appropriate when the model is complex and includes reflective and formative measures (Chin, 2010; Hair et al., 2011), as in this study. PLS

simultaneously assesses the measurement and the structural model. These two steps are described in the following section.

## **4. Results**

### ***4.1 Measurement model analysis***

The research model includes both formative (i.e., normative and deceptive Like-seeking behaviors and PEBs) and reflective (i.e., attitude, perceived behavioral control, subjective norms, intention, CGB and narcissism) constructs.

First, the formative measurement model was assessed (Table 2). In line with previous research (Bissing-Olson et al., 2016; Hand, 2020), the five PEB categories were conceptualized as first-order formative constructs, as there is no reason to expect that all items present strong correlations. Participants could engage in some behavior, such as sharing a car journey with someone, but not others such as walking, cycling or taking public transport for short journeys. Following the same reasoning, normative and deceptive Like-seeking behaviors were conceptualized as first-order formative constructs. The external validity of the formative measurement model was analyzed by assessing the indicators' weights and loadings. The weights of the indicators should ideally be statistically significant. However, Hair et al. (2017) argue that indicators with non-significant weights but high loadings should be retained. Following this criterion, two indicators were removed. The model was then re-estimated. External validity was acceptable (Hair et al., 2017). VIF values were also lower than 5, which indicates that the model has no multicollinearity problems (Hair et al., 2011).

< Table 2 about here >

The reflective measurement model was then analyzed (Table 3). Results suggested the deletion of one item of the narcissism measure, since its standardized parameter estimate was below 0.5, indicating a weak factor loading. After this deletion, the individual item reliability for all factor loadings was confirmed, as they were all greater than 0.60, and statistically significant at 1% (Carmines & Zeller, 1979). The results also show that the Cronbach's alpha and composite reliability (CR) of all constructs were greater than 0.7, confirming internal consistency reliability. The average variance extracted values were above 0.50, which indicates that the convergent validity criteria was supported (Fornell & Larcker, 1981). Discriminant validity was also supported since all HTMT values were below the threshold of 0.90 and that the bootstrap confidence interval did not contain the value 1 (see Table 4).

< Table 3 about here >

< Table 4 about here >

#### ***4.2 Structural model***

To assess the significance of the path coefficients, a bootstrapping procedure with 5000 subsamples was employed. The model explains 58.9% of the intention variance, 49.2% of CGB, 39.7% of eco-driving/transport actions, 40.6% of eco-shopping and eating, 29.6% of waste reduction, 25% conservation and 43.9% of political actions. The  $Q^2$  values for the dependent variables were positive, indicating that the model has predictive relevance. Finally, as the SRMR (standardised root mean square residual) showed a value of 0.075, lower than the threshold of 0.08 (Hu & Bentler, 1998), it can be concluded that the model has good fit. The moderating effect was calculated by creating interaction terms and using the two-stage approach as suggested by Henseler and Chin

(2010). Table 5 presents the structural model results with the five PEB categories as dependent variables, including the t-values and the percentile confidence intervals.

< Table 5 about here >

The relationship between perceived behavioral control and intention to engage in PEBs was not significant ( $\beta = 0.095$ ,  $t = 1.601$ ), leading H1 to be rejected. In support of H2 and H3, both attitude ( $\beta = 0.239$ ,  $t = 4.404$ ) and subjective norms ( $\beta = 0.477$ ,  $t = 7.437$ ) were positively associated with intention to engage in PEBs. Findings show intention to engage in PEBs was positively related to the five PEB categories: eco-driving/transport actions ( $\beta = 0.295$ ,  $t = 5.186$ ), eco-shopping and eating ( $\beta = 0.342$ ,  $t = 5.196$ ), waste reduction ( $\beta = 0.369$ ,  $t = 6.954$ ), conservation ( $\beta = 0.220$ ,  $t = 2.958$ ) and political actions ( $\beta = 0.347$ ,  $t = 7.890$ ). Thus, H4a, H4b, H4c, H4d and H4e were supported. Considering the moderating effect of perceived behavioral control, results reveal that perceived behavioral control only moderated the relationship between intention and the eco-driving/transport PEB ( $\beta = 0.079$ ,  $t = 2.270$ ). Consequently, H5a was supported, whereas H5b, H5c, H5d and H5e were rejected. The results indicate that subjective norms were positively related with CGB ( $\beta = 0.320$ ,  $t = 7.210$ ), supporting H6. Similarly, both normative ( $\beta = 0.322$ ,  $t = 6.471$ ) and deceptive ( $\beta = 0.121$ ,  $t = 2.016$ ) Like-seeking behavior were positively associated with CGB, providing support for H7 and H8 respectively. The relationship between narcissism and CGB was also positive and significant ( $\beta = 0.165$ ,  $t = 3.163$ ). Therefore, H9 was supported. Surprisingly, CGB and intention to engage in PEBs were positively related ( $\beta = 0.118$ ,  $t = 2.264$ ), leading us to reject H10. Hypotheses H11a, H11b, H11c, H11d and H11e were not supported, as findings show CGB was positively and significantly associated with four PEB categories: eco-driving/transport actions ( $\beta = 0.248$ ,  $t = 4.790$ ), eco-shopping and eating ( $\beta = 0.253$ ,  $t = 4.905$ ), waste reduction ( $\beta$

= 0.197,  $t = 3.360$ ) and political actions ( $\beta = 0.380$ ,  $t = 9.042$ ). In addition, the relationship between CGB and the conservation PEB category was non-significant ( $\beta = 0.149$ ,  $t = 2.324$ ).

As shown in Figure 1, several of the variables included in the model act as mediators. Specifically, the proposed model suggests that the relationship between subjective norms and intention can be mediated by CGB. Similarly, the effect of CGB on PEBs can be mediated by intention. Therefore, the potential existence of these indirect paths was explored. Following Preacher and Hayes (2008), the bootstrapping procedure implemented in SmartPLS 3, with 5000 bootstrap resamples, was used to test the indirect effects (Hair et al., 2017). PLS-SEM is a recommended approach in mediator analysis since the bootstrapping procedure makes no assumption about the shape of the variables' distribution (Hair et al., 2017). The results of this estimation are shown in Table 6. As in the structural model, in addition to the  $t$ -values, the percentile confidence intervals (Aguirre-Urreta & Rönkkö, 2018) are included. In all cases, the bootstrap confidence intervals do not contain the value zero, meaning that the indirect effects are significantly different from zero with a 95% confidence level. Specifically, subjective norms indirectly influenced intention through CGB ( $\beta = 0.038$ ,  $t = 2.123$ ). Therefore, CGB partially mediated this relationship. Similarly, CGB influenced the five PEB categories: eco-driving/transport actions ( $\beta = 0.035$ ,  $t = 2.039$ ), eco-shopping and eating ( $\beta = 0.040$ ,  $t = 2.030$ ), waste reduction ( $\beta = 0.044$ ,  $t = 2.166$ ), conservation ( $\beta = 0.026$ ,  $t = 1.710$ ) and political actions ( $\beta = 0.041$ ,  $t = 2.349$ ), via intention. Since the direct relationships between CGB and these variables were also significant, intention partially mediated these relationships. In all cases, the mediation is complementary as both the direct and the indirect effects are significant and point in the same direction (Hair et al., 2017; Zhao et al., 2010).

< Table 6 about here >



## 5. Discussion

Researchers have long called for the incorporation of self-identity into TPB (Ajzen, 1988, 1991) to understand individuals' behaviors (e.g., Alzubaidi et al., 2021; Ateş, 2020; Clark et al., 2019; Yuriev et al., 2020). As social media posts express a virtual self-identity, we found it surprising that few, if any, studies had integrated virtual self-identity into TPB. This is an important area for investigation, given the ubiquity of social media, and because online posts can differ from offline behavior (Hollenbeck & Kaikati, 2012; Wallace et al., 2020). Indeed, while social media is often investigated as a tool to promote PEBs (e.g., de Fano et al., 2022; Han et al., 2018; Hynes & Wilson, 2016; Sujata et al., 2019; Young et al., 2017; Zafar et al., 2021), the relationship between climate change posts on social media and PEBs has been unexplored.

To address this gap, we presented the concept of conspicuous green behavior (CGB), defined as “an individual’s show of support for green behaviors through posts that are overtly displayed on social media, and that may or may not be associated with actual green behaviors offline”, and we asked the following research question: can social media posts about climate change help us to understand individuals’ PEBs, through integrating CGB as a form of virtual self-identity into the TPB?

Results support most of the relationships proposed by the TPB. Integrating CGB into the TPB, findings confirm that CGB is associated with narcissism and deceptive Like-seeking, revealing that there may be a conspicuous aspect to CGB. Findings also show that CGB is informed by subjective norms and normative Like-seeking, supporting our contention that there is a normative component to CGB. Furthermore, while CGB may be a conspicuous online behavior, results show that CGB is positively associated with intention to engage in PEBs and with PEBs. Moreover, differences in the relationships between CGB and some PEBs suggest that some of these

green behaviors may be more ‘conspicuous’ than others. We discuss these findings in detail below and provide suggestions for practitioners and policy makers seeking to encourage PEBs.

### ***5.1 Implications for Theory***

Our study offers several theoretical contributions. We contribute to the understanding of online posts about climate change by presenting the concept of CGB and exploring its antecedents and its outcomes. In investigating these relationships, we also contribute to TPB literature by integrating CGB as a virtual self-identity into the TPB, as illustrated in Figure 1 above. Finally, our findings provide further support for the importance of TPB in studies of PEB. We discuss these contributions further below.

#### ***5.1.1 CGB and its antecedents, within the TPB***

The study reveals ‘dark’ aspects to CGB, as deceptive Like-seeking and the dark triad trait of narcissism are revealed as significant antecedents of CGB. Unlike normative Like-seeking which is a means to gain validation and develop ones’ identity (Dumas et al., 2017), deceptive Like-seeking has been examined as a form of virtual lying whereby those who engage in these forms of behaviors cannot be trusted by others to respond to their needs (Dumas et al., 2020). Furthermore, as a dark triad trait, narcissism is often associated with unethical behavior (Harrison et al., 2018) and conspicuous consumption (Neave et al., 2020). The positive relationship found between narcissism and CGB indicates that CGB can be cynically viewed as a means of promoting the self and a form of conspicuous behavior.

Findings also show that CGB has a normative component, as normative Like-seeking and the subjective norms component of the TPB are significant antecedents of CGB. This is understandable, as CGB reflects a desire to respond to others’ needs, specifically PEB. The effect

of these variables on CGB is stronger than the ‘darker’ components of deceptive Like-seeking and narcissism. Therefore, we suggest that while CGB has a dark side, it is mainly motivated by a desire to fit in, to meet others’ expectations, and to seek validation from others by posting about climate change. This could explain in part the relationship revealed in our study between CGB and both intention and PEBs.

### ***5.1.2. CGB outcomes, within the TPB***

The conceptualization of CGB is a form of virtual self-identify that is theoretically and empirically different to offline self-identity. Therefore, this study also extends the current literature that incorporates self-identity into the TPB (Shaw et al., 2000; Whitmarsh & O’Neill, 2010), by integrating CGB into this theory.

As the virtual self is often suggested to present an ‘idealized’ self when compared with reality (Hollenbeck & Kaikati, 2012), we hypothesized a negative relationship between CGB and both intention and PEBs, theoretically grounded in extant studies of conspicuous posts about charities on social media and offline donation intention outcomes (Wallace et al., 2020). However, we found that individuals who post about climate change on Instagram also intend to engage in PEBs, and they engage in PEBs. We suggest three reasons for these surprising findings.

First, as noted above, CGB is partly motivated by normative antecedents, and it is possible that individuals who post about climate change also intend to engage in, and engage in PEBs, because they feel that they ought to. Second, Shaw et al. (2000) explained that as ethical issues become important to an individual, these issues form part of the self-identity, which guides behavior. While the self-identity in our study is virtual and motivated (at least in part) by less ‘pure’ motives such as Like-seeking and narcissism, creating this virtual self-identity may

nevertheless result in genuine PEB. Third, results indicate that CGB relates in a different way with the categories of PEBs included. CGB is most associated with political actions, eco-shopping and eating, and eco-driving/transport actions, and least associated with waste reduction. The relationship between CGB and conservation was not significant. Ertz et al. (2016) highlighted the heterogeneous nature of PEBs and attributed this heterogeneity, in part, to the various types of goals driving the behavior. Our results support Ertz et al. (2016), as we show that PEBs may have different antecedents, and some PEBs are partly motivated by conspicuous nature of the behavior, whereas other PEBs may be less motivated by this. While Ertz et al. (2016) considered behaviors such as political actions as forms of civic engagement in the socio-political arena, we suggest that by also considering these actions as conspicuous in nature this can give additional insights into individuals' motives for engaging in these actions. We draw on Whitmarsh and O'Neill's (2010) study of the UK public, where they found higher levels of variance for consumption activities such as shopping and eating. Whitmarsh and O'Neill (2010) explained their result by arguing that shopping for material objects is a form of conspicuous consumption and more of an expression of identity than other activities. We suggest that political actions and eco-shopping and eating are more conspicuous behaviors than other forms of PEBs.

Additionally, we assert that these conspicuous behaviors could facilitate further CGB. If an individual is engaging in CGB, they may be more likely to also engage in PEBs that allow them to subsequently post about those behaviors, for example to gain Likes. For example, individuals may post selfies taken while attending political marches or consuming pro-environmental meals, but they might not post about other less conspicuous behaviors such as waste management. Some categories of PEB could therefore be considered as forms of online conspicuous consumption for some individuals, in the context of posts about those behaviors on social media. With this assertion,

we extend Whitmarsh and O'Neill's (2010) contention that some categories of PEB are conspicuous consumption, to the social media context. Furthermore, we extend the literature which advocates that the search for identity on social networks may predict ethical disposition (Gentina et al., 2016), as we show that self-presentation on social media, even when motives are narcissistic or deceptive, is still a motivator for some PEBs.

### ***5.1.3 Reinforcing the importance of TPB***

The study extends the TPB by integrating the virtual self through CGB, revealing subjective norms as an antecedent of CGB, and indicating both intention and PEBs as outcomes of CGB. In addition, we reinforce the importance of the TPB in understanding PEB, as our hypotheses in relation to TPB were mainly supported. However, the relationship between perceived behavioral control and intention was not significant. This finding is consistent with Greaves et al. (2013) in their adoption of the TPB to investigate PEB in the workplace. They found that perceived behavioral control was not significant as a predictor of intention to recycle. Similarly, Roos and Hahn (2019) found that the relationship between these variables was not significant. Indeed, meta-analyses have shown that the relationship between perceived behavioral control and intention is not homogeneous across studies (Notani, 1998). Furthermore, research considering the role of perceived behavioral control as an antecedent in other contexts also suggest that the role of this variable is 'somewhat overestimated' (Kraft et al., 2005). Similarly, the proposed moderating effect of perceived behavioral control in the relation between intention and behavior was only significant in one of the PEB under study (Eco-driving/transport actions). There is little consensus in the literature on the effect of perceived behavioral control and the few studies that have investigated the moderating effect of this variable have shown inconsistent findings. While some works have found significant moderating effects (e.g., Hagger et al., 2022; Steinmetz et al., 2011), other studies report non-

significant effects (e.g., Klöckner & Blöbaum, 2010; Hukkelberg et al., 2014). Nevertheless, the other variables of TPB have relevance to our study, and for other research investigating self-identity and PEBs.

## ***5.2 Managerial Implications***

Our findings provide suggestions for managers seeking to develop social media campaigns to encourage people to post about climate change and share those messages online, and for managers seeking to use social media to encourage offline PEBs.

Engaging in CGB is influenced by normative motives, including subjective norms and normative Like-seeking. Therefore, we suggest that organizations seeking to spread climate change messages may benefit from utilizing imagery that users wish to share, as they believe those images will be appreciated by others. We note that Pursuit at The University of Melbourne (2020) highlighted the role of viral marketing as a key to the planet's health. They emphasized the value of individuals' spread of ideas, and they advocated for the 'stickiness' of ideas which are relevant to their audience to encourage viral spread over social media. As posts about climate change may be motivated by Like-seeking, an analysis of Likes for previous posts could reveal the images and messages which are more likely to achieve further Likes and may inform the development of new content and messages for photos and videos that are more likely to encourage online sharing. Also, as posts about climate change may have normative motives, reference group appeals may encourage sharing.

Furthermore, we show that narcissism is associated with CGB. Therefore, we suggest that social media campaigns involving contexts whereby individuals can 'show off' their PEBs would be effective as they would allow the individual to highlight their good deeds on social media, whilst

also encouraging real offline behavior change. Pro-environmental organizations could also provide online badges or ‘twibbons’ for pro- environmental actions, which individuals could add to their social media profiles to show off their ‘green’ credentials. In addition, pledges to engage in further PEBs such as committing to walk instead of drive for a week or pledging to share car journeys with others for a limited time, could be provided as ‘badges’ to show off on social media. By encouraging these pledges, such behaviors could also become habit forming.

Findings reveal that CGB is associated with intention and PEBs, but the study also shows that some behaviors are more conspicuous than others. For example, the association between CGB and PEBs that are visible to others, including political action (such as going to political protests) or eco-shopping and eating, are stronger than the relationships between CGB and other PEBs such as waste reduction (for example, composting kitchen waste) or conservation (for instance, taking shorter showers to save water). Managers seeking to encourage those conspicuous PEBs could find ways to enhance this behavior by providing ways for individuals to post about it. For example, attendees at political protests about climate change could be provided with hashtags to encourage them to share their experience on social media. Furthermore, the findings also suggest that consumers who engage in CGB, may be less likely to engage in offline behaviors that are ‘hidden’ from others, or less conspicuous behaviors. It may be worthwhile for managers to consider ways to ‘glamorize’ these behaviors or find messages that provide status and conspicuous value for individuals, to encourage them to engage in these behaviors. For example, using image-related messaging about reducing food waste or composting kitchen waste, or engaging celebrity endorsers to support these behaviors on social media, may be a more effective strategy to encourage these individuals to engage in those PEBs, than messages about the impact of waste on the environment.

### ***5.3 Limitations and Suggestions for Further Research***

As with all research, this study carries some limitations, which offer interesting opportunities for further research. First, we introduce the concept of CGB and investigate antecedents and outcomes, to incorporate the virtual self into the TPB. As CGB is a novel concept, we acknowledge that there may be different antecedents and outcomes, which were outside of the scope of the current study. Therefore, we recommend that further studies would consider adding other antecedents to CGB, to extend our conceptual framework. For example, perception of pride and need for uniqueness are both variables that are associated with conspicuous consumption (Kumar et al., 2021). As CGB is a form of conspicuous consumption related to the virtual self, investigating additional antecedent variables such as these may provide new insights into CGB.

Second, the conceptualization of CGB is based on social media posts, mainly images and videos, about climate change on Instagram. Further research would investigate users of other social media networks, such as Facebook. On Facebook, relational ties mean that friendship networks may know each other to some extent, and therefore individuals may not deviate in their self-presentation online because their Facebook friends raise questions about their authenticity (Back et al., 2010; Hollenbeck & Kaikati, 2012). Therefore, the conspicuousness of their posts may be curtailed. In addition, we acknowledge that, offline, green behaviors may also be conspicuous in nature, and although these behaviors are not expressing a virtual and therefore potentially enhanced self, they may nevertheless have narcissistic motives, and inform TPB and PEBs. Thus, we advocate further research to extend insights into this area and to investigate the emerging contention that some PEBs are more conspicuous and may even have some ‘dark’ motives.

Third, further research might also integrate other facets of virtual self-identity into TPB. For example, in the context of prosocial behaviors, the literature distinguishes between



conspicuous consumption that is about ‘doing good’ and conspicuous consumption that is about signaling status (Johnson et al., 2018). While this study considers signaling through ‘doing good’ in the conceptualization of CGB, it may be interesting to investigate a need for status on social media as another aspect of virtual self-identity, and explore its integration into TPB.

Fourth, while the relationships between most variables in the TPB were significant, our study revealed that the relationship between perceived behavioral control and intention was not significant. Moreover, considering perceived behavioral control as a moderator, it was significant only in the relationship between intention and eco-driving/transport actions. The extant literature offers helpful insights into these findings. For example, research suggests that the perceived behavioral control construct may comprise three dimensions (perceived control, perceived attitude, and perceived difficulty) (Kraft et al., 2005) or two dimensions (separating self-efficacy and perceived behavioral control), with perceived behavioral control having no effect on intentions (Terry & O’Leary, 1995). Clearly, the dimensionality of perceived behavioral control and its relationship with intention and as a moderator in the relationship between intention and behavior presents interesting areas for further study.

Fifth, the study does not consider that social media could be a cause of uncertainty or doubt about climate change. The study was conducted among social media users in the United States. As research has suggested that only 44% of Americans believe that climate change is “both happening *and* is human-caused” (Leiserowitz et al., 2014, p. 8), and only 15% are “very worried about its consequences” (Leiserowitz et al., 2014, p. 10), new research could consider the use of our model to curtail any negative messaging about the realities of climate change spread on social media. We also advocate that the research would be conducted in other countries and cultures where messages and beliefs about climate change may differ to the US.

Sixth, we consider that PEB is a positive action and show that Instagram users who post about climate change believe that others will believe they are good people for doing so. However, there are individuals who are opposed to PEBs, for various reasons. The study did not consider the undesired social self, whereby, for example, individuals would refrain from posting online about their beliefs due to concerns that their social network may not approve, and yet they may engage in those behaviors offline. For instance, Marder et al.'s (2018) research on conspicuous political brand interactions shows that the undesired social self and the perceived visibility of posts may impact on their intention to Like political brands. Thus, further research could consider our framework in a scenario where users perceive that their posts about climate change have an undesirable effect on their social network or create an undesired social self.

Seventh, all of our data were collected from self-report measures. Although the full collinearity test based on VIFs was carried out, additional techniques such as the marker-variable method could be used in future studies to confirm that common method bias is not a significant problem in this research. While Fishbein and Ajzen (2010, p. 37) assert that self-reports of behavior can be “quite reliable and valid – perhaps no less so than direct observation of behavior”, we suggest that further study could also consider additional objective measures to triangulate findings and provide further support for the relationship between intention and behavior.

Finally, this study is cross-sectional in nature, in line with studies including Ertz et al. (2016) and Singh et al. (2020). While a later study of behavior may yield more insights regarding the relationship between intention and behavior, de Leeuw et al. (2015) caution that events occurring in between the two measures (intention and behavior) can affect changes in intention or impede individuals from carrying out behavior. Nevertheless, further studies could incorporate an additional, later measure of behavior, to determine whether intention and social media identity in

particular influences behavior in the longer term. We also advocate longitudinal research to yield additional insights into the relationship between social media posts and PEBs.

Nevertheless, despite these limitations, this study reveals new insights by proposing the concept of CGB to explain posts on social media about climate change that reflect an individual's virtual self-identity and by integrating CGB into TPB. The findings provide guidance for new directions in research, and for managers seeking to encourage PEBs, to address one of the grand challenges of our time.

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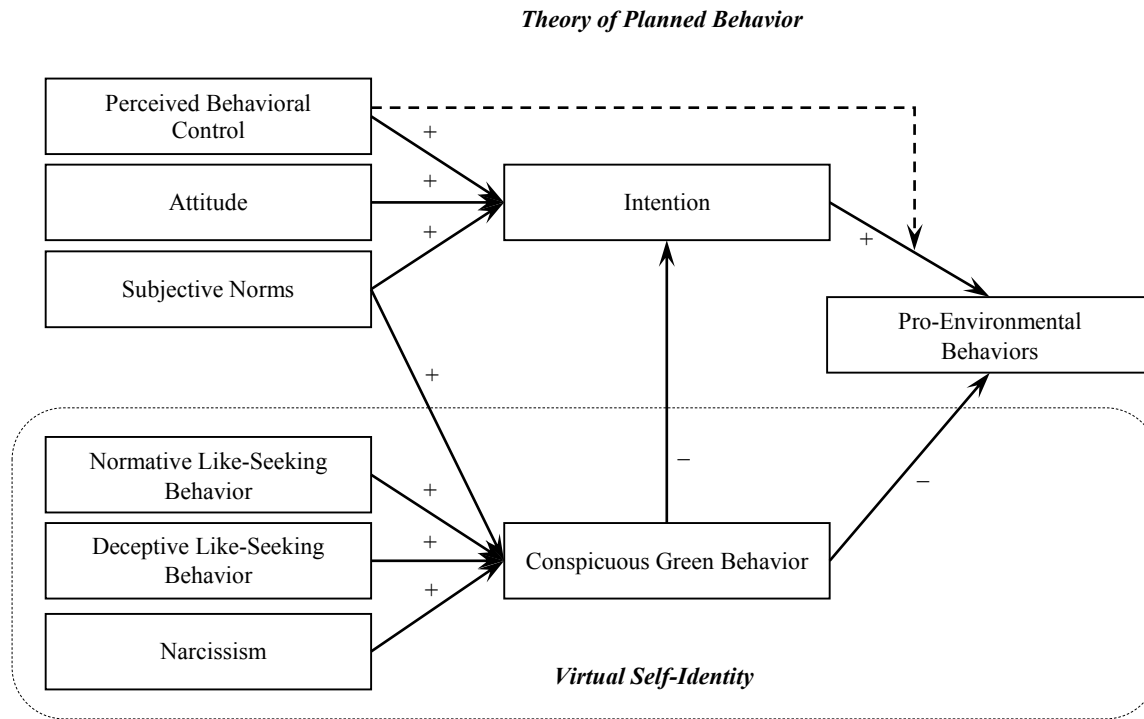
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**Figure 1. Conceptual framework**



Note: Dashed line indicates moderation effect.



**Table 1. Profile of survey respondents (demographics and Instagram use)**

Category	Sample (N = 436)
Gender	35.3% = Female 64.7% = Male
Age	Mean = 33.67 years SD = 8.37
Employment status	89% = Working full-time outside the home 5.3% = Working part-time outside the home 3.7% = Studying full-time 0.9% = Studying part-time 4.4% = Working in the home (e.g., stay-at home Mom/Dad) 1.1% = Unemployed 0.7% = Other
Level of education	1.8% = Primary/Elementary School 13.8% = Secondary/High School 54.4% = Undergraduate Degree or Diploma 28.7% = Master's Degree 0.7% = PhD 0.7% = Other
Children	58% = Yes 41.5% = No 0.5% = Prefer not to say
Place	14.9% = Metropolis (more than 1 million people) 27.8% = Large town (more than 100,000 people) 39.9% = Medium town (20,000-100,000 people) 11% = Small town (5,000-20,000 people) 6.4% = Rural area (less than 5,000 people)
Instagram account	100% = Yes
Number of followers	15.4% = Up to 100 20.9% = 101-300 19.5 = 301-500 16.9% = 501-700 17.2% = 701-900 10.1% = More than 900
Time spent on Instagram (past week)	22.3% = Less than 30 min 19% = 30-60 min 26.6% = 1-2 hours 24.8% = 2-3 hours 7.3% = More than 3 hours

Note: SD = Standard deviation from the mean.

**Table 2. Formative measurement model results**

<b>Construct</b>		<b>Loading</b>	<b>t-value</b>	<b>Weight</b>	<b>t-value</b>	<b>VIF</b>
Normative Like-seeking behavior	NLSB1	0.679	11.171	0.106	1.135	1.823
	NLSB2	0.622	10.976	0.016	0.210	1.803
	NLSB3	0.814	18.143	0.347	3.560	1.704
	NLSB4	0.726	12.811	0.181	1.970	1.757
	NLSB5	0.841	23.070	0.400	4.534	1.720
	NLSB6	0.743	13.722	0.225	2.537	1.646
Deceptive Like-seeking behavior	DLSB1	0.791	17.729	-0.147	1.182	4.873
	DLSB2	0.846	21.134	0.285	2.273	4.792
	DLSB3	0.878	25.849	0.391	3.508	2.997
	DLSB4	0.883	24.419	0.384	3.338	2.851
	DLSB5	0.626	9.160	0.307	3.612	1.171
PEB: Eco-driving/transport actions	PEB1	0.620	7.622	0.275	2.692	1.292
	PEB2	0.774	12.860	0.464	5.267	1.261
	PEB3	0.586	8.034	0.203	2.332	1.323
	PEB4	0.788	15.360	0.426	4.932	1.454
	PEB5	0.510	5.514	0.030	0.274	1.353
PEB: Eco-shopping and eating	PEB6	0.760	14.343	0.347	4.791	1.434
	PEB7	0.740	12.469	0.307	3.540	1.421
	PEB8	0.688	11.328	0.337	3.968	1.238
	PEB9	0.777	16.240	0.357	4.608	1.453
PEB: Waste reduction	PEB11	0.560	3.938	0.442	3.027	1.020
	PEB12	0.899	11.806	0.837	8.588	1.020
PEB: Conservation	PEB14	0.867	11.056	0.670	5.282	1.156
	PEB15	0.782	7.985	0.536	3.884	1.156
PEB: Political actions	PEB16	0.869	27.261	0.290	3.304	2.372
	PEB17	0.982	87.466	0.761	9.775	2.372

Note: PEB: pro-environmental behavior

**Table 3. Reflective measurement model results**

<b>Construct</b>		<b>Factor loading</b>	<b>CR</b>	<b>AVE</b>
Perceived behavioral control	PBC1	0.823	0.887	0.663
	PBC2	0.807		
	PBC3	0.836		
	PBC4	0.789		
Attitude	ATT1	0.780	0.919	0.654
	ATT2	0.764		
	ATT3	0.800		
	ATT4	0.849		
	ATT5	0.777		
	ATT6	0.876		
Subjective norms	SN1	0.856	0.921	0.744
	SN2	0.867		
	SN3	0.877		
	SN4	0.850		
Intention	INT1	0.928	0.936	0.831
	INT2	0.889		
	INT3	0.909		
Narcissism	NAR2	0.757	0.909	0.528
	NAR3	0.708		
	NAR4	0.719		
	NAR5	0.683		
	NAR6	0.682		
	NAR7	0.781		
	NAR8	0.751		
	NAR9	0.670		
	NAR10	0.780		
	Conspicuous green behavior	CGB1		
CGB2		0.843		
CGB3		0.838		
CGB4		0.817		

**Table 4. Heterotrait-monotrait (HTMT) ratios**

	<b>Perceived behavioral control</b>	<b>Attitude</b>	<b>Subjective norms</b>	<b>Intention</b>	<b>Narcissism</b>
Attitude	0.772 [0.679; 0.845]				
Subjective norms	0.626 [0.503; 0.729]	0.536 [0.418; 0.636]			
Intention	0.636 [0.528; 0.730]	0.643 [0.539; 0.724]	0.792 [0.714; 0.857]		
Narcissism	0.082 [0.052; 0.096]	0.139 [0.090; 0.165]	0.267 [0.164; 0.370]	0.219 [0.126; 0.325]	
Conspicuous green behavior	0.415 [0.304; 0.529]	0.481 [0.379; 0.571]	0.606 [0.501; 0.696]	0.579 [0.464; 0.678]	0.506 [0.404; 0.601]

Note: The values in brackets represent the 95% bias-corrected and accelerated confidence interval of the HTMT values.

**Table 5. Structural model results**

Hypotheses		$\beta$	t-value	CI
<b>H1</b>	PBC → Intention	0.095	1.601	[-0.021,0.221]
<b>H2</b>	Attitude → Intention	0.239	4.404***	[0.134,0.343]
<b>H3</b>	Subjective norms → Intention	0.477	7.437***	[0.345,0.600]
<b>H4a</b>	Intention → PEB: Eco-driving/transport actions	0.295	5.186***	[0.187,0.410]
<b>H4b</b>	Intention → PEB: Eco-shopping and eating	0.342	5.196***	[0.215,0.470]
<b>H4c</b>	Intention → PEB: Waste reduction	0.369	6.954***	[0.259,0.471]
<b>H4d</b>	Intention → PEB: Conservation	0.220	2.958***	[0.072,0.362]
<b>H4e</b>	Intention → PEB: Political actions	0.347	7.890***	[0.259,0.433]
<b>H5a</b>	PBC x Intention → PEB: Eco-driving/transport actions	0.079	2.270**	[0.009,0.142]
<b>H5b</b>	PBC x Intention → PEB: Eco-shopping and eating	0.013	0.461	[-0.040,0.077]
<b>H5c</b>	PBC x Intention → PEB: Waste reduction	0.004	0.117	[-0.061,0.070]
<b>H5d</b>	PBC x Intention → PEB: Conservation	0.037	0.775	[-0.059,0.125]
<b>H5e</b>	PBC x Intention → PEB: Political actions	-0.033	1.229	[-0.083,0.027]
<b>H6</b>	Subjective norms → CGB	0.320	7.210***	[0.228,0.404]
<b>H7</b>	Normative Like-seeking behavior → CGB	0.322	6.471***	[0.227,0.422]
<b>H8</b>	Deceptive Like-seeking behavior → CGB	0.121	2.016**	[0.006,0.239]
<b>H9</b>	Narcissism → CGB	0.165	3.163**	[0.067,0.267]
<b>H10</b>	CGB → Intention	0.118	2.264**	[0.013,0.222]
<b>H11a</b>	CGB → PEB: Eco-driving/transport actions	0.248	4.790***	[0.150,0.350]
<b>H11b</b>	CGB → PEB: Eco-shopping and eating	0.253	4.905***	[0.154,0.357]
<b>H11c</b>	CGB → PEB: Waste reduction	0.197	3.360***	[0.079,0.314]
<b>H11d</b>	CGB → PEB: Conservation	0.065	0.956	[-0.064,0.202]
<b>H11e</b>	CGB → PEB: Political actions	0.380	9.042***	[0.303,0.468]

Note: PBC: perceived behavioral control; CGB: conspicuous green behavior; PEB: pro-environmental behavior; \*\*\*p<0.01; \*\*p<0.05; CI: Percentile confidence interval

**Table 6. Indirect effects**

	$\beta$	t-value	CI
Subjective norms → CGB → Intention	0.038	2.123**	[0.005,0.076]
CGB → Intention → PEB: Eco-driving/transport actions	0.035	2.039**	[0.004,0.072]
CGB → Intention → PEB: Eco-shopping and eating	0.040	2.030**	[0.005,0.085]
CGB → Intention → PEB: Waste reduction	0.044	2.166**	[0.005,0.085]
CGB → Intention → PEB: Conservation	0.026	1.710*	[0.002,0.061]
CGB → Intention → PEB: Political actions	0.041	2.349**	[0.005,0.074]

Note: CGB: conspicuous green behavior; PEB: pro-environmental behavior; \*\*\*p<0.01; \*\*p<0.05; \*p<0.1; CI: Percentile confidence interval

## Appendix. Constructs and items

Construct	Items
Perceived behavioral control	PBC1 I feel that I am able to make changes to my lifestyle to adopt pro-environment actions
	PBC2 If I wanted to, I could take pro-environment actions in the next month
	PBC3 For me, taking pro-environment actions in the next month would be possible
	PBC4 Taking pro-environment actions in the next month is up to me
Attitude	ATT1 Harmful/Beneficial
	ATT2 Bad/Good
	ATT3 Worthless/Valuable
	ATT4 Unpleasant/Pleasant
	ATT5 Dull/Exciting
	ATT6 Unenjoyable/Enjoyable
Subjective norms	SN1 Most people that are important to me take pro-environment actions
	SN2 The people in my life whose opinion I value would think that I should take pro-environment actions
	SN3 Most people that are important to me think that I should take pro-environment actions
	SN4 Most people like me take pro-environment actions
Intention	INT1 I intend to take one or more pro-environment actions in the forthcoming month
	INT2 I will try to take one or more pro-environment actions in the forthcoming month
	INT3 I have planned to take one or more pro-environment actions in the forthcoming month
Normative Like-seeking behavior	NLSB1 Uploaded a picture
	NLSB2 Taken a picture
	NLSB3 Used a filter
	NLSB4 Used a hashtag
	NLSB5 Uploaded a picture at a certain time of the day
	NLSB6 Shared Instagram posts to other social networking sites (e.g., Facebook, Twitter)
Deceptive Like-seeking behavior	DLSB1 Purchased followers
	DLSB2 Purchased likes
	DLSB3 Used software to modify your physical appearance
	DLSB4 Taken down a picture and then put it back up at a later point
	DLSB5 Liked other people's pictures (i.e., 'Like' for 'Like')
Narcissism	NAR1 I can become entirely absorbed in thinking about my personal affairs, my health, my cares or my relations to others
	NAR2 My feelings are easily hurt by ridicule or by the slighting remarks of others
	NAR3 When I enter a room I often become self-conscious and feel that the eyes of others are upon me
	NAR4 I dislike sharing the credit of an achievement with others
	NAR5 I dislike being with a group unless I know I am appreciated by at least one of those present
	NAR6 I feel that I am temperamentally different from most people
	NAR7 I often interpret the remarks of others in a personal way
	NAR8 I easily become absorbed in my own interests and forget the existence of others
	NAR9 I feel that I have enough on my hands without worrying about other people's troubles
	NAR10 I am secretly 'put out' when other people come to me with their troubles, asking me for my time and sympathy

<b>Construct</b>	<b>Items</b>	
Conspicuous green behavior	CGB1	I like to post about climate change on Instagram because I get to show my support.
	CGB2	I like to post about climate change on Instagram so that people know I am a good person.
	CGB3	I like to show people that I care about climate change by posting about it on Instagram.
	CGB4	I like to mention climate change on Instagram because it makes me look good.
PEB: Eco-driving/ transport actions	PEB1	Drive economically (e.g., braking or accelerating gently)
	PEB2	Walk, cycle or take public transport for short journeys (i.e., trips of less than 3 miles)
	PEB3	Use an alternative to traveling (e.g., shopping online)
	PEB4	Share a car journey with someone else
	PEB5	Cut down on the amount you fly
PEB: Eco-shopping and eating	PEB6	Buy environmentally friendly products
	PEB7	Eat food which is organic, locally grown, or in season
	PEB8	Avoid eating meat
	PEB9	Buy products with less packaging
PEB: Waste reduction	PEB10	Recycle <sup>a</sup>
	PEB11	Reuse or repair items instead of throwing them away
	PEB12	Compost your kitchen waste
PEB: Conservation	PEB13	Turn off lights you're not using <sup>a</sup>
	PEB14	Save water by taking shorter showers
	PEB15	Turn off the tap while you brush your teeth
PEB: Political actions	PEB16	Write to your government representative about an environmental issue
	PEB17	Take part in a protest about an environmental issue

Note: PEB: pro-environmental behavior; <sup>a</sup> item deleted in the validation process