Leading by Example in Encouraging Sustainability in the Workplace

The role of Institutional Support and Leadership Behaviour in enhancing Pro-environmental Behaviour

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Abstract

Pro-environmental behaviour (PEB) of people is important for the protection of the environment and thus for humanity. Unfortunately, while PEB is extensively studied in the household setting, PEB at the workplace has received relatively little scientific attention. This study tries to strengthen the research of PEB at the workplace by retesting previous research and at the same time tries to confirm it in a different workplace setting. The model uses the Theory of Planned Behaviour (TPB) constructs attitude towards behaviour, subjective norms, and perceived behavioural support, and the organisational concepts institutional support and leadership behaviour, as predictive constructs, while using intention to act and actual pro-environmental behaviour as outcome constructs. Using a cross-sectional design, an electronic survey gathered information on the constructs from 540 employees of four different housing associations in the Netherlands. The results show that institutional support and leadership behaviour are significant predictors of both intention to act and actual PEB of housing association employees. The TPB construct subjective norms also predicts both intention and behaviour significantly, while attitude only predicts behaviour. Perceived behavioural control has no relation with either intention or behaviour.

Executive Summary

Already since Brundtland (1987) gave the now most used definition of sustainability, it is clear that the use of resources by humanity can hardly be considered as sustainable. In other words, right now resources are used in such a way that future generations will be negatively impacted by it. It is therefore desirable that people act more environmentally friendly than they do now, both at home and at work. While a lot of research about pro-environmental behaviour (PEB) at households has already been conducted, PEB at the workplace is comparatively hardly studied. This study will therefore add to the current body of literature on PEB at the workplace. More specifically, this study has two major goals: firstly, to retest a previously used model to confirm the results; secondly, to test the previously used model in a different workplace setting (i.e. different organization) to see whether previously attained results can be used in different settings.

The model used is based on the Theory of Planned Behaviour (Ajzen, 1991). This model states that (any) behaviour is determined by two concepts: the intention to display this behaviour ('intention to act'), and the extent to which people feel they are actually able to display this behaviour ('perceived behavioural control'). Intention to act in turn is determined by the attitude of a person towards the specific behaviour, the extent to which the person feels group pressure ('subjective norms'), and again perceived behavioural control (PBC). This model is enhanced by two constructs specifically designed to be used in a workplace setting: the support a person perceives to have from the organization ('institutional support'), and exemplary behaviour of the direct supervisor of a person ('leadership behaviour'). According to the proposed model, the new constructs institutional support and leadership behaviour influence the intention of a person to act in a certain manner, just as attitude, subjective norms, and PBC.

The model is tested at four Dutch housing organizations. Combined, 540 employees answered an electronically distributed survey which asked them about all above mentioned constructs, being institutional support, leadership behaviour, attitude, subjective norms, PBC, intention to act, and PEB. The survey yielded 481 usable responses. For each respondent factor analyses distilled scores for each individual construct.

The scores for each construct were subsequently used in two linear regression analyses. The first one used intention to act as the outcome variable and institutional support, leadership behaviour, attitude, subjective norms, and PBC as the predictors. The results showed that institutional support, leadership behaviour, and subjective norms have a significant relation with intention. This suggests that these predictor variables do indeed predict the intention of a person to behave pro-environmentally. Interesting to note is that both attitude and PBC do not influence intention strongly in this model.

The second model used pro-environmental behaviour as de outcome variable, and all other variables as predictor variables (including intention to act). The results show that again institutional support, leadership behaviour, and subjective norms have a significant relation, this time with behaviour. Important to note however is that attitude in this model also has a significant relation with behaviour (which it does not have with intention). In fact, attitude in this model has the strongest relation with behaviour of all predictor variables.

The results suggest that institutional support, exemplary leadership behaviour, attitude towards pro-environmental behaviour and subjective norms concerning PEB are important concepts that influence the PEB of employees at the workplace. Especially institutional support and leadership behaviour are of importance to the management of organizations, as these items are most likely to be improved by organizational measures, interventions, and/or policies.

Contents

Introduction

Already since Brundtland (1987) gave the now most used definition of sustainability, it is clear that the use of resources by humanity can hardly be considered as sustainable. In other words, right now resources are used in such a way that future generations will be negatively impacted by it. To diminish this negative impact humanity is having (or will have) on its future generations, we must, logically, change our behaviour now. By simply using less resources, e.g. by reducing demand or by recycling resources, we can diminish our impact. This study sees this behaviour, using less resources, as more sustainable or more environmentally friendly behaviour[1].

In the past two decades, many studies investigated pro-environmental behaviour (PEB). Most of these studies are investigating it in households or communities. However, people spend considerable time outside the house, e.g. at the workplace. In the Netherlands people spend on average, with a sample population aged from 12 years old and upwards, 20 hours per week at work (Cloïn *et al.*, 2013). While we use resources and produce waste during that time, the workplace setting is studied since only recently and is rather underrepresented in general PEB research. For example, at this time it is often unclear whether empirical findings from one study using type of workplace setting can be extrapolated to another. Furthermore, only few models have been retested to confirm their validity. The present study will try to expand the current literature on PEB at the workplace by trying to alleviate the problems mentioned above and by expanding contemporary models.

Literature

This study will focus on the Theory of Planned Behaviour (TPB, see Ajzen (1991)). Empirical research has collected evidence for its validity in the workplace setting (Greaves *et al.*, 2013; Blok *et al.*, 2014). But looking at recent TPB criticism (Sniehotta *et al.*, 2014), it requires further validation in different workplace settings. Originally, the TPB stated that the two factors attitude towards a certain behaviour and subjective norms (or group pressure) concerning a certain behaviour predicts actual behaviour. This was called the Theory of Reasoned Action (Ajzen and Fishbein, 1980). It was soon discovered that intention often did not lead (fully) to behaviour, as people only followed their intention when they felt they were actually able to conduct that behaviour (Ajzen and Madden, 1986). This control is called perceived behavioural control. For example, a person might have the intention to recycle, but is unable to do so because he or she doesn't know what recycle bins to use. This person thus is restricted in their behaviour by a lack of perceived behavioural control (PBC). The TPB is thus essentially the theory of reasoned action with PBC. This theory has often been used and validated. See for example McEachan *et al.* (2011) for a meta-analysis. Important to note is that when PBC is very high, i.e. a person feels very in control of his or her behaviour, intention is the main predictor of behaviour (according to this theory) and PBC is not.

Specifically for the household setting, current research in different fields contains a wealth of information on a large number of predictors of PEB (Kollmuss and Agyeman, 2002; Blok *et al.*, 2014; Steg *et al.*, 2014). Concerning the workplace setting, while there is research that shows that PEB at the workplace may be adopted from practices already used at home to a limited extent (Smith and O'Sullivan, 2012), many studies have shown that PEB in households is *different* from PEB at the workplace, even within the same individuals (Tudor *et al.*, 2007; Littleford *et al.*, 2014). It is therefore clear that to understand PEB at the workplace, results of household studies cannot be used without due consideration. For example, while the TPB has indeed been used in the household setting successfully (Nye and Hargreaves, 2010; Greaves *et al.*, 2013; Blok *et al.*, 2014), this does not mean that it can be used in the workplace unreservedly. Specific research in the workplace setting should be conducted. Importantly to note is that

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[1] Pro-environmental behaviour is therefore defined as all behaviour concerning the physical environment that reduces the negative impact we have on the ability of future generations to meet their own needs. Similarly to Kollmus and Agyeman (2002), who defined it as *"behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world (e.g. minimize resource and energy consumption, use of non-toxic substances, reduce waste production)"*. While they don't specify how a negative impact would actually manifest for future generations, we specify it as a reduction in the ability of future generations to meet their needs. Our definition is also very similar to what Howell (2013) calls "environmental responsible behaviour", which could arguably be a better term. But this article isn't about terminology.

the definition of PEB in the workplace is slightly different than from PEB in households. In households all behaviour is voluntary, but at the workplace employees are subjected to governmental or organizational rules or policies. Their efforts to behave environmentally friendly may be due to these rules, regulations or policy, rather than due to their own voluntary environmental commitment. In our study, PEB at the workplace is therefore only that behaviour that is voluntary.

Next to the TPB, many other predictive factors for actual PEB at the workplace have been investigated as well (Norton *et al.*, 2014). For example Blok *et al.* (2014) used factors they called 'leadership boss' and 'institutional support', which respectively represent whether employees feel that their leaders show exemplary PEB, and whether employees feel their organization supports them in showing PEB and informs them about environmental practices of the organization. To analyse these factors more in-depth, research on Perceived Organizational Support and Leader-Member Exchange is very useful. These factors are extensively studied in relation with Organizational Citizenship Behaviour, which therefore must be explained first.

The 'original' theory on Organizational Citizenship Behaviour (OCB) entails the efforts of employees at work that benefit their employer, and that go beyond their job requirements or employer expectations. More precisely, OCB is defined as *"individual behavior that is discretionary, not directly or explicitly recognized by the formal reward system, and in the aggregate promotes the efficient and effective functioning of the organization"* (Organ *et al.*, 2006b). For example, "*helping co-workers with a job related problem*" (Bateman and Organ, 1983). More specifically, imagine a problem an employee has that, if kept unresolved, affects the quality of a final product. The employee is simply unable to solve the problem in his or her own and is therefore likely to keep the problem unresolved. This problem might thus in turn negatively affect a party down the supply chain inside the company or outside. The problem therefore hinders the efficient and effective functioning of the organization. A co-worker might decide to help the employee resolve the problem, improving the quality of the final product and making a party down the supply chain a little more satisfied. While the helping behaviour of the co-worker is not explicitly recognized by the formal reward system of the organization, the behaviour does in fact promote the efficient and effective functioning of the organization. Now back to this study, pro-environmental behaviour of employees at the workplace might be defined as an OCB, as it often is not directly recognized by the formal reward system. However one could dispute whether the behaviour has value for the effective and efficient functioning of the organization itself or for the world in general[2]. However, Boiral, Paillé, and colleagues have already started to investigate OCB in relation to PEB (Boiral, 2009; Boiral and Paille, 2012; Paille and Boiral, 2013; Paille *et al.*, 2013). Their results are explained below.

A predictor for OCBs (and therefore possibly for PEB by employees) is Perceived Organizational Support (POS). This entails the *"perceptions of employees of the organization's commitment to them, and the employees' global beliefs concerning the extent to which the organization values their contributions and cares about their wellbeing"* (Shore and Wayne, 1993). Consequently, classical studies have found evidence for positive relationships between POS and OCBs, where the perceived support of organization leads to OCBs of the employees directly (Eisenberger *et al.*, 1990; Shore and Wayne, 1993). In other words, the more an employee feels supported by the organization, the more OCBs the employee will display. A recent sophistication in this field is the adoption of POS-E, or Perceived Organizational Support towards the Environment (Lamm *et al.*, 2014). In this construct it is determined to what extent an employee feels supported by his or her organization to engage in PEB specifically (Temminck *et al.*, 2013; Lamm *et al.*, 2014). Lamm *et al.* (2014) found that POS and POS-E, the latter of which he defined as *"the specific beliefs held by employees concerning how much the organization values their contributions toward sustainability"*, are related but distinct constructs. The other way around works as well, Smith and O'Sullivan (2012) found that employees often have ideas for environmental behaviours, but do not engage in these because of anticipated barriers which might be lifted by management

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[2] PEB of employees is of course of value for the future of our world, and in that sense also of value for the organization being part of that future. However, to measure the value of OCBs for organizations, OCB research generally limits itself to measures such as financial gains, competitive gains, etc.

Blok *et al.* (2014) uses the construct 'leadership support', which is not entirely the same as POS-E, but similar. This construct originally focused on *active* forms of managerial support. For example, it entails the extent to which top management actively informs employees on environmental effects of the work of the employee (Blok *et al.*, 2014). But leadership support in general is not limited to merely informing of course (Smith and O'Sullivan, 2012), though it is a good example of managerial effort on which employees can act voluntarily (as opposed to policy, on which employees have to act mandatory). POS or POS-E on the other hand also measures whether an employee feels supported by her or his organization in a *passive* way, i.e. by the attitude of the organization regarding (the actions of) the employee (Eisenberger *et al.*, 1986; Lamm *et al.*, 2014). To get a better overview of the efforts and attitude of an organization regarding her employees, this study will incorporate both active as passive aspects of managerial support, as explained in the methods section.

Next to POS, concerning OCB several studies mark the importance of Leader-Member Exchange (LMX). This construct describes the relationship between employees and their direct supervisors in terms of the exchanges between them and their value. Exchanges could, for example, consist of material resources, information, or support (Wayne *et al.*, 1997). The higher the value of these exchanges, the higher the quality of the LMX relationship (see Settoon *et al.* (1996) and Wayne *et al.* (1997) for a more elaborate explanation). Several studies found empirical evidence for the hypothesis that POS and LMX are distinct constructs, though related (Wayne *et al.*, 1997; Tekleab and Chiaburu, 2011; Paille *et al.*, 2013). This means that, while not the same, there is a close relation between support from the organisation and support from direct supervisors. Also, both have a positive relationship with OCB (Settoon *et al.*, 1996; Wayne *et al.*, 1997; Tekleab and Chiaburu, 2011).

Regarding PEB, one might design a supervisory construct conceptually based on, for example, the LMX theory. But Ramus (2002) used another approach. She simply asked employees what kind of behaviours of supervisors they thought would support the PEB of employees. This way she created, in effect, a construct based on empirical findings. This study determined six categories of behaviours which are valued by employees: innovation, competence building, communication, information dissemination, rewards and cognition, and management of goals and responsibility. These results, in turn, were used to define a construct called Perceived Supervisory Support (PSS) (Raineri and Paillé, 2015), which is conceptually still very similar to LMX-theory. PSS was used in a study that found a positive relation between PSS and PEB of employees (Raineri and Paillé, 2015). Furthermore, Robertson and Barling (2013) found evidence that the PEB of supervisors influences the PEB of employees, and conceptualized it as the employee learning or imitating the behaviour of the supervisor. They did not necessarily see it as the employee feeling supported by the supervisor, which makes it different from LMX. Similarly, Blok *et al.* (2014) examined this link more specifically using their construct of Leadership Boss. This shows a major difference between PSS and Leadership Boss. While the former determines to what extent supervisors support employees in PEB and determines with which kind of behaviours it does so, the latter determines to what extent employees engage in PEB because their supervisor sets the (right) example. In other words, PSS asks the employee "what do you need from your supervisor to behave environmentally friendly yourself?", while leadership boss asks the employee "does your supervisor engage in PEB, and do you engage in PEB because your supervisor does so?". While behaviours that are determined by PSS *may* stimulate PEB among employees because they are exemplary behaviours, they may also stimulate PEB because of an entirely different reason. In other words, employees are influenced by their direct supervisors and this influence can be measured in different, partly overlapping ways, depending on the perspective one might take. This study will focus on how the environmentally friendly exemplary role of supervisors influences employees, as explained in the methods section.

To summarize, a positive relation between the TPB and PEB of employees has been conceptualized and empirically tested (Greaves *et al.*, 2013; Blok *et al.*, 2014). Leadership in the specific forms of POS and LMX is related to OCB in general (Settoon *et al.*, 1996; Wayne *et al.*, 1997; Tekleab and Chiaburu, 2011). A positive link between POS and PSS on the one hand and OCB towards the Environment on the other is also found (Lamm *et al.*, 2014; Raineri and Paillé, 2015).

The influence of leadership was only superficially tested in TPB studies (Blok *et al.*, 2014). This research might therefore benefit from the more elaborate research on organizational support (POS) and supervisory support (PSS). As one of the objectives of this research is to confirm previous research, we choose to use the constructs of leadership boss and institutional support of Blok *et al.* (2014) as a starting point and augment them with parts of POS and PSS research. As the TPB uses intention to act as a intervening variable, we will test two models. The first model will test whether the predicting variables have a positive relation with outcome variable intention to act. The second model will test whether the same predicting variables *and* intention to act have a positive relation with pro-environmental behaviour. See Figure 2 and Figure 2 for a visual representation.
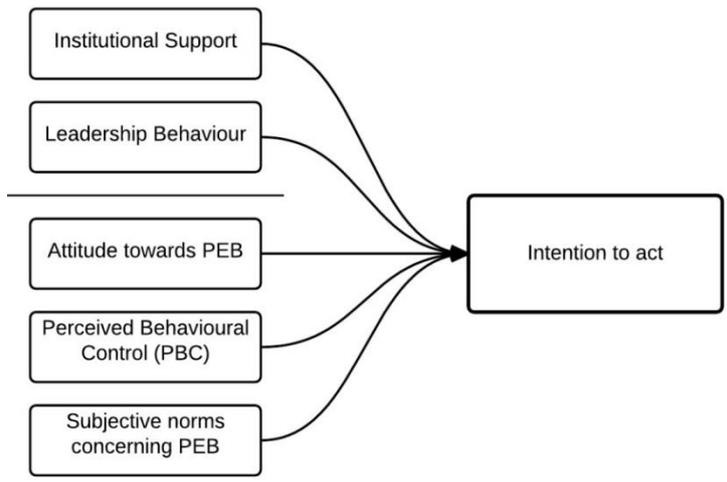

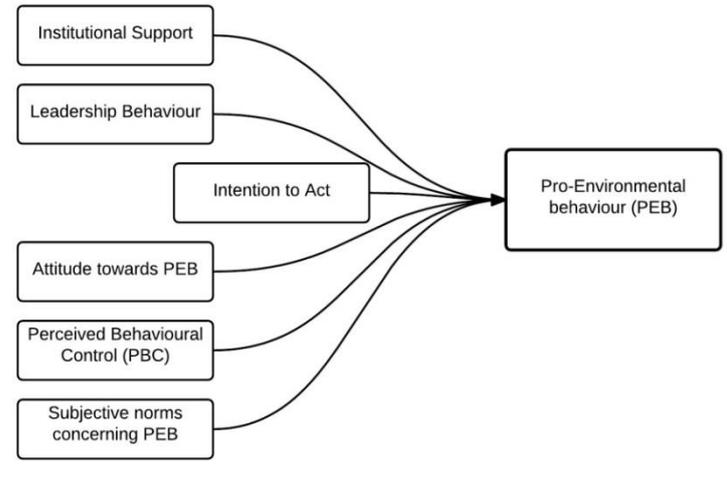**Figure 2: Model 1 with 'intention to ac' as outcome variable**

Figure 2: model 2 with actual PEB as outcome variable

Method

Survey

To test the models we will survey employees of different housing associations in the Netherlands. We will employ a cross-sectional approach using an online survey. This will allow us to gather data quickly and uniformly. To receive as many responses as possible, we will distribute the survey at four associations of different sizes. Together with the management department of the associations an email with a link to an online survey was sent to all the employees of each participating association.

The survey contains questions on all variables. All questions, except demographic data, are measured on a 5-point likert-scale. To increase comparability with a previous study, the variables attitude towards PEB, perceived behavioural control, subjective norms and intention to act will be measured identically as Blok *et al.* (2014). Some minor adjustments are made to the measurement of the outcome variable actual PEB, as not all questions are relevant for the participating housing associations.

As mentioned, the original variable leadership boss in the previous study focused on the exemplary behaviour of direct supervisors. Unfortunately, the PSS construct of Raineri and Paillé (2015) and its origins (Ramus, 2001; Ramus, 2002) cannot be used to measure exemplary behaviour. They measure perceived behaviour of supervisors, which can or cannot be exemplary. For example, while PSS measures whether *"My immediate superior, …. encourages environmental initiatives"* (Raineri and Paillé, 2015), this behaviour may or may not be also setting an example for the employee. On the other hand, the construct of leadership boss only measures whether the employee feels that he or she acts environmentally friendly because her or his supervisor also does so, without actually determining what this behaviour entails. To maintain the reliability of leadership boss, the PSS studies can therefore not be used. As leadership boss in the original study attained an acceptable Cronbach's Alpha of 0.70, we chose not to adjust the original variable and to measure it identically as in the previous study.

The variable leadership support in the previous study is renamed to institutional support in this study. This variable originally focused on *active* forms of managerial support. For example, it measured whether top management actively informed employees on environmental effects of the work of the employee (Blok *et al.*, 2014). POS or POS-E also measures whether an employee feels supported by her or his organization in a *passive* way, i.e. by the attitude of the organization regarding (the actions of) the employee (Eisenberger *et al.*, 1986; Lamm *et al.*, 2014). The variable institutional support used in this study is therefore augmented with three questions. These questions are items 10, 21, and 27 of the SPOS (Eisenberger *et al.*, 1986). The questions are adjusted in such a way that they concern pro-environmental behaviour.

This study uses a measurement of behaviour much like that of Blok *et al.* (2014) and Lamm *et al.* (2014). Behaviour is measured using items asking for specific behaviours, such as turning off electrical devices, using the heating less, or using a bicycle or public transit to go to the workplace, rather than a car. The danger in these questions is that not all topics are relevant for all employees or organizations. Some organizations have a very strict policy on commuting to work for example. The use of public transit by employees is not so much due to the employees own initiative but more due to the policy. Furthermore, some organizations have heating systems installed in such a way that employees are not able to adjust them. This makes the question 'I turn off the heating outside office hours' impossible to answer. The same applies when lightning is dependent on sensors rather than on pushing a button. This problem is further exacerbated by the fact that different organizations have different policies and technical installations, making it very difficult to come to one questionnaire for all organizations, even when taking into account the different policies etc. However, we want to assess the voluntary environmental friendliness of an employee.

Obviously, this study is not interested in whether a specific employee turns off the lights as often as possible, but is interested in a kind of average environmentally friendly behaviour. This means that for individual respondents, we

do not need answers on all PEB questions. For example, when an employee of organization A does turn off the heating often, but cannot turn off the lights as that is done by sensors, this employee should be considered environmentally friendly. When an employee of organization B turns of the lights often but cannot change the heating settings as this is done centrally, this employee should be considered environmentally friendly as well. This example shows that while different employees can give answers to different questions, we feel that these employees can still achieve a similar 'PEB score'. To come to a score for each respondent that adequately represents his or her environmentally friendly behaviour, this study asks each respondent nine questions about PEB. All items are evaluated by each respondent on a 5-point Likert scale. An option 'not applicable' is included for when an employee is not able to display a certain behaviour, as explained earlier. Only those respondents that have rated at least six out of nine items on the Likert-scale receive an overall PEB score. In other words, when respondents answer more than three times 'not applicable', these respondents are not used in the analysis. This way, a composite score is generated for the respondents that reflects their PEB, though the score for different employees may be generated out of the ratings of different PEB items.

Study objects

This study is performed at four Dutch housing associations of different sizes. The housing associations are under government regulation and all share the same social goal: provide (rental) housing for lower income households. Seemingly similar from this point of view, the associations however are relatively free in employing commercial business, making every association very different[3]. Concerning size, nationally there is a wide variety among associations. Some have less than 50 employees, some more than 500. Of the in this study participating associations, the largest is active in the east, centre, and west of the Netherlands (association B), while the other three are only active in their own region in the south of the Netherlands (associations A, C, and D). All of the participating associations have a mission or vision statement that says that they not only simply supply homes, but that they also have a responsibility to improve the 'livability' of neighbourhoods.

On a national scale all Dutch housing associations have an agreement with the government to upgrade their all their homes to a certain minimum of energy efficiency[4] (Spies *et al.*, 2012). Three of the four associations also participate in a project called the 'Stroomversnelling'[5]. In this project existing homes are renovated in such a way that during a year they generate as much energy as they consume, usually using PV/solar panels. In effect this means that these homes have no electricity bill ('nul-op-de-meter', i.e. zero-on-the-meter)[6]. As only six of a total of more than 300 Dutch housing associations are participating in this project, so the three associations in our study that are participating might be regarded as having a more active environmental policy. Nevertheless, there are many more environmental projects in which other associations are active, focusing for example on building materials, so it is very hard to draw conclusions on participation on 'Stroomversnelling' alone. An overview of the associations participating in our study is presented in Table 1.

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[3] However, due to commercial activities gone bad in the past years, the government is now working to reduce these commercial activities in the housing associations drastically

[4] More specifically, homes should have at least energy label B by 2020. This energy label system is similar to the EU energy labelling scheme for white goods, light bulbs, and cars. See http://www.rijksoverheid.nl/onderwerpen/energielabel-gebouwen (in Dutch) for more information

[5] This is a play on words. It is the Dutch word for the English word (river) rapid(s). However, you could also translate it literally as 'current acceleration'. This can concern not only the current in a river, but also a current of electricity. I like to read the term as 'to accelerate a transition in how we use (or generate) electricity'. See http://stroomversnelling.info/ (in Dutch) for more information

[6] This is the case because at the moment, households can sell back the surplus energy they generate back to the electricity network. In practice this means that when they generate more electricity than they consume (generally during the day) the electricity meter goes backwards. In the evening during peak demand of the household and low solar electricity generation, the reverse is happening.

Data analysis

A principal component analysis, using varimax rotation, created, for each respondent, a component score for each construct. It did so using, again, those items pertaining to each individual construct. The Kaiser-Meyer-Olkin measure of sampling adequacy examined the suitability of each constructs of principal component analysis. All constructs have a KMO value equal to or higher than 0.5, which is the cut-off point. Bartlett's Test of sphericity examined whether correlations among survey items are too small to be suitable for a component analysis. In each component analysis the correlations of the items proved to be not too low, given that each Bartlett's test yielded significant values.

A multiple regression analysis used the demographic variables gender and age, and component scores of every construct of the model, to ascertain whether different constructs can predict either intention to act and/or pro-

	Association			
	A	B	C	D
# of homes	14500	48800	7000	27400
# of fte's	151	590	90	371
Values	together, ambitious, people-focused, reliable, aproachable	open, self-conscious, reliable, dedicated	aware of our environment, independency, sustainability, reciprocity, transparancy, legitimacy	involved, skilled, clear
Participates in 'Stroom-versnelling'	Yes	Yes	Yes	No

environmental behaviour. All analyses, unless stated otherwise, are executed using IBM SPSS Statistics v22.

Table 1: Overview of housing associations (according to annual reports of 2013)

Results

Descriptive statistics

540 surveys were completed. To measure actual PEB, respondents answered nine questions about their behaviour. Not every respondent appeared to be able to execute every type of behaviour (e.g. when lighting is controlled by sensors respondents are unable to turn off the lights themselves). To accommodate for this fact all nine PEB items in the survey contained the option 'not applicable' next to the Likert-scale from one to five. The number of respondents that answered 'not applicable' for each PEB item is shown in Table 2. Most notably lightning and heating are items that have been rated 'not applicable'. This is not surprising, most associations mentioned informally that heating and lighting are controlled centrally and/or by sensors.

Table 2: number of times respondents entered 'not applicable' for each PEB item. N=540.

I recycle as much as possible at the workplace	21
I used scrap paper rather than a new sheet of paper for notes	12
If I wouldn't live far from the workplace, I would go to work by bike are walking rather than by car	33
I turn off the lights when I leave my office last	157
I turn off the lights in empty rooms when I pass by	129
I turn off all electronic devices at the end of the day	19
When it is offered in our canteen, I choose organic food or beverages	94
For each cup of coffee/tea I use a new carton/plastic cup	76
I take care to lower or turn off the heating outside office hours	247

As mentioned, an actual PEB construct is generated using at least six valid ratings of each respondent on the nine PEB items in the survey. All items that are rated in the Likert-scale from one to five are considered valid. All items that are rated 'not applicable' are not considered valid. Of all cases, 481 yielded at least six valid answers on the PEB items. Another way to create the PEB construct would be to use only the respondents that gave valid answers to every individual PEB item, nine in total. Of the 540 respondents, only 204 gave valid answers to all nine PEB items. To see whether there are large differences between the 481 sample and the 204 sample we have compared the average scores of these samples for each item. Obviously, concerning the 481 sample, the average score for each PEB item is made out of less than 481 ratings, as not everyone in this sample answered each question. The comparison is displayed in Table 3.The items about recycling and organic food/beverages are the same (4.25 and 3.2 respectively). For all other items the more stricter 204 sample scores lower than the 481 sample, except for the scrap paper item. This is also the largest difference between the two samples, being 0.2. The highest score is for turning off electric devices *and* turning of the lights at the end of the day, which almost everyone says he or she does. It must be remembered though that lighting is in fact usually managed by sensors or timers, rather than direct input by employees. Low scores (compared to other scores) are given to the question about organic food/beverages consumption in the canteen. Turning off the heating outside office hours is also not often done, while this, very similar to lighting, is often managed centrally rather than directly by office employees (though there are instances where employees can fine-tune the temperature in a room within a certain margin). All items are scored on a Likert-scale from one to five. As all differences are all very small, we assume that the differences between the samples do not influence the final results.

Table 3: Mean of PEB items using the different sample sizes. All items are scored in a Likert scale from 1-5.

	N=481		N=204	
	Mean	Std. Dev	Mean	Std. Dev
I recycle as much as possible at the workplace	4.25	0.97	4.25	0.95
I used scrap paper rather than a new sheet of paper for notes	3.46	1.33	3.66	1.27
If I wouldn't live far from the workplace, I would go to work by bike are walking rather than by car	4.35	1.05	4.31	1.04
I turn off the lights when I leave my office last	4.57	0.87	4.47	0.94
I turn off the lights in empty rooms when I pass by	4.00	1.19	3.92	1.18
I turn off all electronic devices at the end of the day	4.57	0.93	4.51	0.95
When it is offered in our canteen, I choose organic food or beverages	3.20	1.36	3.20	1.28
I take care to lower or turn off the heating outside office hours	3.48	1.29	3.39	1.26
For each cup of coffee/tea I use a new carton/plastic cup	4.13	1.24	4.01	1.27

In Table 4 the mean scores of the different constructs are shown with N=481. As the purpose of this study was to try to confirm previous studies, the values of Blok *et al.* (2014) are shown beside it, as well as the difference between the studies. Interestingly, employees of housing associations (i.e. this study) score the questioned items considerably higher than those of a university (i.e. Blok et al., 2014). While both surveys used a Likert-scale from one to five, all scores in the associations sample are considerably *and* significantly higher. Most notably PEB is scored much higher, with a full point over that of the university sample. All other constructs score almost half a point higher in the housing associations sample, except subjective norms which scores 0.14 higher.

Unlike all other scores, the intention of housing associations employees is low compared to the intention of university employees. The average is half a point lower.

Table 4: Mean values of the different construct, all scored on a 5-point Likert scale

	Current study	Std dev	Blok *et al.* (2014)	Std dev	Difference in mean	t-value	sig.
IS	2.81	0.86	2.37	0.66	0.44	8.469	0.000
LB	3.30	0.76	2.83	0.73	0.47	9.386	0.000
AtB	4.21	0.58	3.82	0.35	0.39	11.918	0.000
SN	4.18	0.72	4.04	0.64	0.14	3.049	0.001
PBC	3.84	0.89	3.45	0.76	0.39	6.981	0.000
PEB	4.02	0.60	2.99	0.65	1.03	24.619	0.000
Intention	3.17	1.10	3.68	0.93	-0.51	-7.435	0.000

PEB=Pro-environmental behaviour; IS=Institutional Support; LB=Leadership Behaviour; AtB=Attitude towards Behaviour; SN=Subjective Norms; PBC=Perceived Behavioural Control. NOTE: IS in the present study consists of both POS-E items and Leadership Support items. In Blok et al. it only consists of Leadership Support items. N=481

Reliability

We test the reliability of the different constructs using Cronbach's Alpha. See Table 5 for details. All constructs have acceptable alpha's, except perceived behavioural control. As we used the same items as in Blok *et al.* (2014), this value is not surprising. The alpha for attitude could be increased considerably if the reversed scored item "I think too much attention is paid to pro-environmental behaviour" is removed. It might be that respondents had difficulty answering the question. It is likely that they should have given a very different score to this item than to the other

questions (as it is a reversed *scored* item). Possibly respondents automatically filled in a score similar to the other scores. However, as the alpha is still acceptable when the item is included, we choose to retain this item.

Reliability of pro-environmental behaviour is difficult to measure. When using only those respondents that gave valid answers to all nine PEB items, a sample of 204 remains with an alpha of 0.630. An alpha of PEB construct used (N=481) for the analyses is impossible, as this construct consists of different items for different respondents, but the indication is that the reliability is acceptable.

Constructs	Items	Cronbach's Alpha	Comments
Institutional Support	*My boss/head of the department supports me in showing pro-environmental behaviour at work. (LS)* *My employer informs me about the environmental impact of my behaviour at work. (LS)* *My employer informs me about projects on sustainability at my housing association (LS)* *My employer informs me about environmental policy of my department (LS)* *I learn environmental friendly behaviour at work (LS)* *There is a supervisory support for the environmental effort of the employees (LS)* *The organization cares whether I am satisfied with the environmental policy and how employees behave accordingly (POS-E)* *The organization takes pride in the way I perform environmentally friendly at work (POS-E)* *The organization is willing to extend itself if I would want to perform my job as environmentally as possible (POS-E)*	.918	If this item is deleted, Cronbach's Alpha would increase to 0.929
Leadership Boss	*I show the pro-environmental behaviour, when my boss/head of the department behaves pro-environmentally in the workplace.* *It is important to me that my boss/head of the department shows pro-environmental behaviour at work.* *Seeing my boss/head of the department acting pro-environmentally influences my own acting*	.736	
Attitude towards Behaviour	*I'm in favour of behaving pro-environmentally in the workplace.* *I think it's a good idea when the housing association as an employer supports pro-environmental behaviour in the workplace* *An pro-environmental attitude in the workplace is important to me* *I think too much attention is paid to the pro-environmental behaviour in the workplace. (reverse coded)* *I think it is good when colleagues show pro-environmental behaviour*	.794	If this item is deleted, Cronbach's Alpha would increase to 0.893
Subjective Norms	*What in your opinion should your colleagues do at work?* *Print double-sided?* *Copy double-sided?* *Recycle paper?* *Turn off the computer/notebook when not in use?* *Arrange a telephone or video-conference instead of travelling to a business meeting?*	.775	If this item is deleted, Cronbach's Alpha would increase to 0.798
Perceived Behavioural Support	*If I wanted to, I could easily behave pro-environmentally in the workplace.* *Whether I perform pro-environmentally is entirely up to me.*	.530	
Pro-Environmental Behaviour (N=204)	*I recycle as much as possible* *I use scrap paper rather than new paper for notes* *If I would live close to work, I would go to work by bicycle (or walking) rather than by car* *I turn off the lights when I am the last to leave the office* *I turn off the lights in empty rooms when I pass them* *I turn off all my electronic devices at the end of the day* *If it would be offered in our canteen, I would choose organic food and beverages* *I use a new paper/plastic cup for each cup of coffee/tea (reverse coded)* *I take care to turn off or down the heating outside office hours*	.630	If this item is deleted, Cronbach's Alpha would increase to 0.665

Regression

We created regression scores for each individual construct, determined by a PCA with Varimax rotation. These regression scores are subsequently used in regression analyses. Table 6 displays the results of the regression with intention to act as the dependent variable. Demographic variables do not significantly influence intention to behave pro-environmentally. However, the independent variables institutional support, leadership behaviour, and subjective norms test as having a significant relation with intention. This means that among our respondents, statistically, the named independent variables either influence intention, or intention influences the named independent variables. Leadership behaviour has the strongest influence on intention with a coefficient of 0.263. Interestingly the TPB constructs attitude and behavioural control have no significant relation with intention. There is also no significant difference between housing associations. The highest Variance Inflation Factor (VIF), which checks for multicollinearity issues, is 1.8, indicating no problems with multicollinearity. The overall R^2 of the model is 0.221, where a value of 1 would mean a perfect fit and a value of 0 a non-existing fit. Even though the R^2 differs greatly among social sciences studies, also concerning PEB at the workplace, it is rarely above 0.7. The value of 0.221 is, compared to other studies, not particularly low.

Table 6: Regression of model 1 with Intention to Act as the dependent variable

	B	st. err.	sig	
(Constant)	-0.202	0.154	0.189	
Gender	0.053	0.089	0.548	
Age	0.055	0.043	0.203	
Institutional Support	0.109	0.052	0.038	**
Leadership Behaviour	0.263	0.052	0.000	***
Attitude towards Behaviour	0.056	0.049	0.256	
Subjective Norms	0.193	0.050	0.000	**
Perceived Behavioural Control	0.057	0.044	0.193	
A -> B	-0.027	0.119	0.821	
A -> C	0.169	0.157	0.283	
A -> D	0.037	0.114	0.745	

N=481, * p<0.1; ** p<0.05; *** p<0.001

Table 7 displays the results of the regression with PEB as the dependent variable. This construct is created by, for each respondent, taking the mean of at least six valid answers from the PEB items. Both institutional support and leadership behaviour constructs have a significant and positive relation with pro-environmental behaviour. This is similar to their relation with intention, though the relation between leadership behaviour and PEB is much weaker than it is with intention. Also, the TPB constructs attitude and subjective norms influence PEB positively. Interestingly intention has no relation with PEB. This could explain statistically (rather than conceptually) why attitude has a very strong relation with PEB here, while there was no relation between attitude and intention (see Table 6). Just as with intention, behavioural control has no relation with PEB. Furthermore, just as with intention of the employees, demographic characteristics and working for a specific housing associations do not have an significant influence on the behaviour of individual employees. The highest Variance Inflation Factor (VIF) is 1.8, indicating no problems with multicollinearity. The overall R^2 of the model is 0.259.

Table 7: Regression with PEB as the dependent variable

	B	st. err.	sig	
(Constant)	-0.046	0.148	0.759	
Gender	-0.108	0.085	0.207	
Age	0.063	0.042	0.132	
Intention to Act	0.048	0.044	0.277	
Institutional Support	0.104	0.050	0.040	**
Leadership Behaviour	0.095	0.052	0.067	*
Attitude towards Behaviour	0.335	0.047	0.000	***
Subjective Norms	0.122	0.049	0.012	**
Perceived Behavioural Control	0.005	0.042	0.904	
A -> B	-0.131	0.114	0.252	
A -> C	-0.028	0.151	0.851	
A -> D	-0.091	0.110	0.407	

N=481, * p<0.1; ** p<0.05; *** p<0.001

Outliers

The model displayed in Table 7 has four outliers, determined by their standardized residual being higher than 3x the standardized deviation A regression analysis without these outliers yields a model with an R^2 of 0.281, which is considerably better than the model including the outliers. However, the coefficients of the independent variables, and the significance of their relation with the dependent variable, did only change to a very limited extent. All independent variables remained in the same p-value category (e.g. p<0.5).

To see whether the outliers have undue influence over the model, several statistical methods and values were employed. These are leverage values, Cook's distance, Mahalanobis distance, standardized DFBeta values, and the Covariance Ratio (Field, 2009). None of the outliers have a leverage value higher than twice the average, none have a Cook's distance larger than 1, the highest Mahalanobis distance is 14, far below cut off points for a sample of almost 500 cases and 12 predictors. Standardized DFBeta values are all below 1, indicating no undue influence of the outliers on the different predictors. However, the Covariance Ratio might give cause for concern. If the ratio for a case is lower than 1 - 3((k + 1)/n), where k are the predictors (11) and n is the sample size (481), that case would increase the precision of the parameters. In this case, all cases are lower than this value (0.925), with most being around 0.8, but one case is 0.7. This means that removing the outliers would indeed increase the precision of the parameters. However, considering that all other values do not give cause for concern, we choose to retain all cases in the sample.

POS-E vs. leadership support

Below Table 8 displays the results of a regression analysis similar to that of Table 6 and Table 7. In this model, all the demographic variables and constructs are present. This analysis is run with both intention as the dependent variable as PEB. The difference is that institutional support is now split into two constructs, one with the leadership support items as used by Blok *et al.* (2014), and the other with the POS-E items. Only the results of these individual constructs is shown.

The table shows that while leadership support has no significant relationship with either intention or behaviour. POS-E on the other hand does in fact have a significant relationship with both intention and behaviour. The significant relation between institutional support and both intention and behaviour (Table 6 and Table 7) is therefore mostly due to the POS-E items.

Table 8: Overview of results of regression analysis with institutional support split in leadership support and POS-E constructs.

Dependent variable →	Intention		PEB	
	Coëfficient	Sig.	Coëfficient	Sig.
Leadership Support	-0.023	0.754	-0.019	0.780
POS-E	0.144	0.046	0.138	0.048

N=481

Discussion

Average scores

Table 4 shows there is a substantial difference in the average scores on the different constructs between this study and Blok *et al.* (2014). All average scores, except for intention, in this study are higher. The differences in institutional support, leadership behaviour, and perceived behavioural control could be explained by different setting or organization. For example, different employers support the employees in different ways, different policies to steer supervisors causes them to execute their exemplary role differently, and the different internal rules allows the employers different degrees of freedom to act as the themselves see fit.

The difference in attitude and subjective norms is harder to explain and are unexpected. To begin with, these items are less than the other constructs influenced by the organization. Furthermore, Wageningen University and Research Centre, where the sample of Blok *et al.* (2014) was taken, is known for its sustainability efforts. Not only that, also the research conducted by academic staff (around half of the sample) is often related to sustainability. These two points would give cause to think that employees of the WUR actually have a strong environmentally friendly attitude. It is difficult to find similar focus on sustainability among the housing associations or their employees in this study. It is therefore unexpected to find that employees of housing associations score themselves higher on attitude towards the environment and subjective norms.

The final difference in actual behaviour between the two settings might have a rather simple explanation. Management of three out of the four housing associations mentioned that in most office rooms both lighting and heating are not adjustable by employees. Furthermore, at least two associations mentioned that they used ceramic cups or glasses rather than plastic or carton cups for coffee or tea. However, as Table 2shows, only few respondents actually entered 'not applicable' for the relevant questions. It is very possible that these respondents, instead of choosing 'not applicable' gave this questions a score of five out of five. Employees at the university are in fact able to adjust the heating and lighting in offices, and coffee machines do in fact use plastic cups (though employees may bring their own ceramic cup or glass). So while it is very easy to score five points on these questions for the housing associations employees, this is unlikely to happen just as much with university staff. These relatively high scores on the lighting, heating, and coffee cups items by housing associations may thus explain the higher score on pro-environmental behaviour.

The Theory of Planned Behaviour

The non-existing relationship between intention and PEB might be explained by the high score on PEB itself. Compared to the university sample, the respondents of this study self-report that they behave rather environmentally friendly (see Table 4). Simultaneously, their intention to behave environmentally is low. Possibly respondents do not feel the need to behave even more environmentally friendly, as asked by the item in the survey that measures intention. In other words, it might be logical that a person that already acts very environmentally friendly, won't be inclined to improve on this behaviour even more, resulting in a non-existing relationship between intention and behaviour.

The results do not confirm significant relations between behavioural control on the one hand and PEB or intention on the other. While this is not in line with Blok *et al.* (2014), it is in line with Greaves *et al.* (2013). In their study which focused on three specific types of conservation behaviours, PBC had a significant relation with the intention to turn off PCs when leaving the desk (though a

relatively weak one) and a relation with the intention to use video-conferencing rather than travelling to a meeting, but they did not find a significant relationship between PBC and the intention to recycle at work. However, meta-analyses on the TPB do in fact show strong relations between PBC and both intention and behaviour (Armitage and Conner, 2001; McEachan *et al.*, 2011). While this would mean that our results are unexpected, there actually is a sound explanation. Ajzen (1991) maintains that:

> *"When the behavior/situation affords a person complete control over behavioral performance, intentions alone should be sufficient to predict behavior, as specified in the theory of reasoned action. The addition of perceived behavioral control should become increasingly useful as volitional control over the behavior declines." Ajzen, 1991, p.185*

Armitage and Conner (2001) elaborate on this point, saying:

> *"…in situations where (for example) attitudes are strong, or where normative influences are powerful, PBC may be less predictive of intentions." Armitage and Conner, 2001, p.472*

As described in the literature review section, the Theory of Reasoned Action (mentioned by Ajzen in the quote above) posits that behaviour is in fact determined by intention, and intention is determined by only attitude and subjective norms. However, when people did not feel in control of their action, this model did not give very good results. For this reason, the TRA was supplemented with PBC, resulting in the Theory of Planned Behaviour.

In the quotes above the authors say that when people feel they are in control of their actions (i.e. a high PBC) *and* when there is a strong positive attitude and/or normative influence towards the intention, the *relevance* of PBC is reduced severely. Only when people *do not* feel in control (i.e. a low PBC), PBC actually in fact has predictive power. More specifically, PBC is less relevant, or has less predictive value, when both the TPB premises (i.e. attitude/subjective norms have a relation with intention, and intention has a relation with behaviour) are true and when PBC is high. In fact, the Theory of Reasoned Action alone should now give suitable results. Our results show that in our case people do indeed feel in control of their actions, as shown with the relatively high value of PBC in Table 4. Furthermore, subjective norms does indeed have a strong relationship with intention, which is the condition as stated by (Armitage and Conner, 2001). Unfortunately, intention is not a significant predictor for behaviour, a condition for the TPB in general. However, in a model with only the TPB constructs, i.e. without leadership behaviour and institutional support (see later in this chapter) intention is in fact a strong predictor for behaviour (as still is subjective norms). In other words, in this model PBC is less relevant, because both the average value of PBC is high (i.e. people feel in control of their actions) and the relation between subjective norms and intention is high. In more practical words, people feel in control of what they want to do and therefore state in the survey that they feel that behavioural control is neither hindering nor stimulating their intention (or behaviour). The 'irrelevance' of PBC in our case leads to the result that PBC has no relation with either intention or behaviour. Management could of course implement stricter rules regarding PEB among employees. This would probably cause PBC to become more important and relevant. But it is beyond the scope of this study to predict whether PEB would actually go up in this case.

Institutional Support and Leadership Behaviour

Both institutional support and leadership behaviour relate positively with both intention and PEB. As mentioned, institutional support consists of both POS-E items (Lamm *et al.*, 2014) as leadership support items (Blok *et al.*, 2014). Previous research showed positive relationships between both POS-E and leadership support on the on hand and PEB on the other (Blok *et al.*, 2014; Lamm *et al.*, 2014). Closer analysis of our data shows that regression analyses identical to that in Table 6 and Table 7, but with institutional support split into the two constructs leadership support and POS-E, yield interesting results. With both intention and behaviour as the dependent variables, POS-E has a significant relation with both dependent variables. At the same time, the leadership support construct does not. This means that the significant relations between institutional support and both intention and behaviour in Table 6 and Table 7 are practically entirely due to POS-E. This partly contradicts the results of Blok *et al.* (2014). There, while leadership support also did not have a significant relation with intention, it did in fact have a significant and positive relationship with behaviour.

A possible reason for the non-existing relationship between the leadership support construct and intention or PEB in this study could be about information dissemination. Several items this study used to measure institutional support asked to what extent respondents felt informed. These items were taken from the leadership support measurement of Blok *et al.* (2014). However, Ramus (2002) concluded that information dissemination *"does not to date have an important effect on employee behaviour" (p.163)*. This means that, concerning the PEB of employees, it does not matter whether organizations disseminate information about environmental friendly behaviour or sustainability efforts. The construct leadership support contains several items about information dissemination. All these items thus do not contribute to pro-environmental behaviour of employees (or their intention). They therefore also do not contribute, in a statistical sense, to a significant relation between leadership support and behaviour. In this study, the other items in leadership support also contributed too little to behaviour to result in a *significant relation* between leadership support and behaviour. In other words, the findings of Ramus (2002) could explain why the leadership support items in institutional support as used in this study do not relate significantly with PEB. In other words, the reason that there is no relation between leadership support on the one hand and behaviour on the other, is that information dissemination (a large part of leadership behaviour) actually does not influence behaviour of employees. Whether organizations inform their employees a lot about sustainability efforts etc., or practically never, the behaviour of employees is not impacted by this. Therefore, it remains unclear why Blok et al. (2014) did in fact find a positive relationship between leadership support and PEB, as it should not matter whether organizations do or don't disseminate information.

Importantly, in this study the POS-E items did in fact have a significant relation with both intention and behaviour. This in in line with Lamm *et al.* (2014), who found a similar strong relation between POS-E and behaviour[7]. The passive kind of support tested by POS-E is therefore important for the PEB of employees. This was not tested in (Blok *et al.*, 2014).

Interestingly to note is the difference between a *relation* between two constructs and the ratings or score of *individual* constructs. The items based on POS-E represent a certain type of passive support from the organization, while the items based on leadership support represent a certain type of

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[7] The items to measure POS-E in this study differ slightly from those of Lamm *et al.* (2014).

mostly active support from the organization. The results of this study show that POS-E has a significant relation with both intention and behaviour, while there is no relation between leadership support and intention or behaviour. This means that the leadership support kind of active support by organizations is *less* important than the passive support of POS-E when looking at the reasons of employees to engage in PEB. However, this does not necessarily mean that employees think that their organization fails in said active leadership support, it only means that it is not an important reason for them to engage in PEB. This is (by chance) exemplified by a higher average score, as rated by the housing associations employees, for the leadership support items (2.84) than the average score for the POS-E items (2.74). Though small, the difference is in fact significant ($P<0.001$). Furthermore, Blok *et al.* (2014) did in fact find a relation between leadership support and behaviour (though not with intention). Their average score for that construct was 2.37 (called institutional support in Table 4). This means that while university employees think that their organization shows *less* active support towards employees concerning PEB (compared to housing associations employees), they do feel it is an important reason to actually engage in PEB (unlike housing associations employees).

Similarly to institutional support, exemplary leadership behaviour by the direct supervisor shows a positive significant relation with both intention and PEB. The previously attained results indicating a link between leadership behaviour and *intention* by Blok *et al.* (2014) are thus confirmed in this study. But while they did not find a link between leadership behaviour and *PEB*, this study did in fact find a significant relationship. Possibly teams in housing associations are much smaller, which might lead to more valued interaction between supervisors and employees. Hypothetically, the smaller the group, the closer the relation between employee and supervisor. Then, the better the relation between employee and supervisor, the more likely that the intention of the employee (induced by supervisor behaviour) is converted to actual behaviour. However, research to date has difficulty confirming empirically that smaller groups actually improve the effect supervisors have on employees regarding the behaviour of employees (Cogliser and Schriesheim, 2000; Cohen *et al.*, 2012).

The relation between leadership behaviour and intention is much stronger than between leadership behaviour and PEB. Thus although employees have a higher intention to act environmentally friendly when their supervisors act environmentally friendly as well, their actual behaviour is less so directly impacted by it. Previous research did indeed show significant positive relations between PEB and leadership of direct supervisors or managers (Egri and Herman, 2000; Ramus, 2002; Graves *et al.*, 2013; Robertson and Barling, 2013; Raineri and Paillé, 2015). These studies however did not look specifically at exemplary behaviour by the supervisor, but focused on concepts such as transformational and transactional leadership. This limits their applicability for the construct of leadership behaviour as used in this study. Leadership behaviour in this study nevertheless remains an important predictor for intention and PEB.

Conclusions

To stimulate employees to act more environmentally friendly, it must be understood <u>why</u> an employee would act pro-environmentally in the first place. Based on an extensive literature review, this study proposed a model with several predictors to pro-environmental behaviour of employees. This model is based on the Theory of Planned Behaviour and two from literature adapted perceived support constructs (institutional support and leadership behaviour). The validity of this model was empirically tested at several Dutch housing associations. The results demonstrate that the TPB might, in this situation, not be well suited to predict PEB of employees for several reasons. Firstly, attitude towards the environment is not a significant predictor for intention, and in turn intention to act is not a significant predictor of actual behaviour. This might be due to the way intention is measured in this study, namely to what extent employees have the intention to behave *more* environmentally friendly in the near future. An intention to behave more environmentally friendly is only possible when there is actually room for improvement. As Table 4 shows, actual environmentally friendly behaviour is already very high, and simultaneously intention to act more environmentally friendly is low. This is especially true when you compare these values with that of the values of a university sample (Blok *et al.*, 2014). Despite a very positive attitude towards PEB, employees simply do not have the intention to act *more* environmentally friendly because they already behave very environmentally friendly in practice. Secondly, perceived behavioural control is not a significant predictor for either intention to act or behaviour. This might be due to the fact that employees in this case do not feel a lack of behavioural control. It is therefore logical that their intention or their behaviour is not impacted by this construct. Intention and behaviour would, thus, be determined by attitude and subjective norms alone (in the TPB).

Institutional Support and exemplary Leadership Behaviour also have an important effect on PEB of employees. The predictive power of a model without these constructs is small. But such a model, with only the TPB constructs, would not only suffer from low predictive power, but would also leave out many valuable insights that are useful when trying to improve PEB of employees. For example, imagine the HR department of an organization trying to change the leadership behaviour of direct supervisors, knowing that this influences PEB of employees. The department might do this by simply sending out a memo, reminding the supervisors about the importance of the environment and about their function as a role model, being a direct supervisor. This action by the HR department is probably easier than their efforts to actually change the attitude of all the employees, or the subjective norms they are experiencing. This is what the critics of the TPB mean when they say that the TPB not necessarily actually helps to develop interventions (see the subchapter Implications, limitations and future research below). Furthermore, it is important to remember that both passive support from the organization (in this study) as well as active support (Blok *et al.*, 2014) are important for behaviour. Both should be remembered when developing interventions to improve PEB of employees. For example, when institutional support is low, a possibly reason is that employees feel that management is doing too little to show employees how to actually behave environmentally friendly. This example of active support could be improved upon by simply supplying recycling bins and posters of what to recycle in what bin. Another reason for low institutional support might be that employees feel that management simply doesn't care whether employees put effort in behaving more environmentally friendly. This problem might be solved by creating monthly environmental champions among employees, passively showing employees that the organization values the efforts of employees.

Interesting to note is the difference in relationship strength between leadership behaviour and intention on the one hand and leadership behaviour and PEB on the other. The former is much

stronger than the latter. Apparently there is still something concerning leadership behaviour that is inhibiting the step from intention to actual behaviour. Nevertheless, exemplary behaviour by supervisors is in fact an important predictor for PEB of employees and the implications for practitioners are obvious.

The demographic variables gender and age do not significantly influence behaviour. Whether an employee works at one of the four associations used in this study also does not significantly influence the results. This means that our sample, even though taken at four different organizations, is still relatively uniform. Furthermore, all our constructs were tested to be reliable indicators, save for PBC, which further improves the validity of the results.

Implications, limitations and future research

This study adds to the body of literature that questions the validity of the TPB. Furthermore, concerning applicability in the management field, we agree with Sniehotta et al. (2014) who posits that the TPB "*does not help practitioners to develop helpful interventions*" (p.4). Individual constructs, such as AtB and SN however are in fact valid predictors according to our results and might in fact be useful for managers and policy makers. The results that also IS and LB are important for the behaviour of employees are probably much more useful for managers and policy makers, as these concepts are much better adjusted for management interventions at both public and private enterprises.

All measures in this study were assessed using a self-reporting survey. While relatively easy and quick to administer and analyse, the results of the survey may be biased to some extent towards a socially desired image of the respondents. Especially the outcome variables intention and PEB are prone to this bias. Objective measurements such as measuring the amount of recycled material or energy consumption in kWh's might give more reliable results. Furthermore, while in many cross sectional studies, including this one, conclusions are often something like 'the predictor variable thus influences the outcome variable'. In reality, cross sectional designs such as employed by this study obviously cannot draw these conclusions. While the significance of a relationship between different variables might be determined, the conceptual direction of the relation is only hypothetical. Only experimental designs, where the different variables can be manipulated by the researchers, can determine the direction of relations. Also, respondents are free to participate in the survey. This means that a certain response bias might occur. One might imagine that employees with an indifferent attitude towards the environment chose not to participate, as for them the survey does not sound interesting. Especially average values in this study of the individual constructs might differ from the actual averages of the entire population. The average values of the individual constructs do not mean much on their own. They can however be compared to the values of other studies when those studies used a similar methodology. The relation between different constructs also remains valid, despite the response bias.

Exemplary Leadership Behaviour is just one of the ways in which a supervisor influences the behaviour of employees. While our results indicate that exemplary behaviour is indeed important, it is only a (small) part of the total influence a supervisor has over employees. While other studies have indeed addressed this the topic (Ramus, 2002; Paille *et al.*, 2013; Raineri and Paillé, 2015), more attention could be given to this concept.

There are different views on how pro-environmental behaviour should be measured. In this study, much like e.g. Lamm *et al.* (2013), very concrete behaviours are used, such as recycling and turning of electrical devices. However, it might be that:

> *"workplace environmental citizenship…"* [i.e. PEB] *"…entails more than manifesting discretionary conservation behaviors. It suggests a broader pattern of conduct that includes actions such as keeping abreast of the environmental affairs of the company, expressing one's opinion about environmental issues and policies, and making innovative environmental suggestions, as well as promoting ecological concerns to colleagues, volunteering in environmentally related activities, and encouraging others to do the same"* (Raineri and Paillé, 2015).

The research in Organizational Citizenship Behaviour towards the Environment (OCBE) therefore uses different measures to assess PEB by employees (Boiral and Paille, 2012). These measures are based on a categorization of behaviour in the light of Organizational Citizenship Behaviour (OCB) (Organ *et al.*, 2006a). While both measures, PEB as being used in this study on the one hand and OCBEs on the other, have their pros and cons, a discussion on which one would be the 'better' one remains conceptual. There is no research that has collected empirical evidence showing which of the two types of behaviour (specific behaviours in this study and more abstract behaviours with OCBE) has the most profound positive impact on the environment. It might very well be that they measure different things, and that they are therefore both valuable and useful and actually complement each other. Future research could investigate the difference both type of behaviours have on the actual environmental performance of organisations. Furthermore, future research might use OCBE measurements with the TPB as a predicting model to clarify the difference between both methods.

The use of OCBE measurements for actual behaviour might also alleviate a problem of comparability among different organizations. Not every specific environmental behaviour, as used in our study, can be qualified as voluntarily in each organization, sometimes certain behaviours are not possible at all. For example, using a new carton/plastic cup for coffee or tea is not possible if there are only ceramic cups that an employee uses the entire day. OCBE behaviours on the other hand are not dependent on specific behaviours can therefore be used in any organizational setting.

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Annex

Correlations matrix for the different constructs

	Pro-Environmental Behaviour		Intention to Act		Institutional Support		Leadership Behaviour		Attitude towards Behaviour		Subjective Norms		Perceived Behavioural Control
Pro-Environmental Behaviour	1.000												
Intention to Act	0.243	**	1.000										
Institutional Support	0.196	**	0.302	**	1.000								
Leadership Behaviour	0.278	**	0.390	**	0.550	**	1.000						
Attitude towards Behaviour	0.435	**	0.217	**	-0.003		0.232	**	1.000				
Subjective Norms	0.333	**	0.280	**	0.098	*	0.196	**	0.476	**	1.000		
Perceived Behavioural Control	0.167	**	0.201	**	0.153	**	0.224	**	0.231	**	0.258	**	1.000