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How to cite

LALOT, Fanny et al. When does self-identity predict intention to act green? A self-completion account relying on past behaviour and majority-minority support for pro-environmental values. In: Journal of environmental psychology, 2019, vol. 61, p. 79–92. doi: 10.1016/j.jenvp.2019.01.002

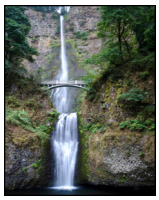
This publication URL: https://archive-ouverte.unige.ch/unige:167734
Publication DOI: 10.1016/j.jenvp.2019.01.002

Journal of Environmental Psychology 61 (2019) 79–92

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep



When does self-identity predict intention to act green? A self-completion account relying on past behaviour and majority-minority support for pro-environmental values

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ARTICLE INFO

Handling Editor: Jeff Joireman

Keywords:
Majority support
Minority support
Minimal-maximal standards
Self-identity
Self-completion theory
Pro-environmental behaviour

ABSTRACT

"Green" self-identity, that is, how much individuals view themselves as environmentalists, generally predicts pro-environmental intentions and behaviour. Factors moderating the strength of this link are, however, not clear yet. In the present paper, we examine how past green behaviour and majority/minority support for environmental values conjointly moderate the effect of an aspired-to green self-identity on pro-environmental intention. We rely on self-completion theory as an overall framework and propose that self-identity would mainly predict future action to the extent that the self is perceived as incomplete. We report four experimental studies (N = 1078) that assessed green self-identity and measured or manipulated past green versus non-green behaviour, and majority versus minority support for environmental values. Results revealed an overall positive link between self-identity and pro-environmental intention that was cancelled specifically at high levels of past green behaviour when a majority supported the participant's pro-environmental values (i.e., when the self was complete).

1. Introduction

The environmental issues we might have to face in the future constitute a global challenge that necessitates all individuals to take action. Determinants of individual pro-environmental actions are multiple, and much research effort has been devoted to identifying them as well as their precise role. Within the scope of psychology, a consistent body of research has notably focused on the effect of "green" self-identity, that is, how much individuals think of themselves as environmentalists. Factors moderating the strength of this link are, however, not clear yet. In the present paper, we propose to examine how past green behaviour and numerical (majority or minority) support for one's environmental values conjointly moderate the effect of green self-identity. We rely on self-completion theory (e.g., Wicklund & Gollwitzer, 1982) as an overall framework to account for these effects, on the premise that self-identity should mainly predict future action to the extent that the self is perceived as incomplete. We first outline the overall effect of self-identity described in the literature before we turn to the moderating effects of past behaviour and numerical support for environmental values.

1.1. The effect of self-identity on intention and behaviour

Self-identity refers to a person's sense of self. It is generally understood as a label that people use to describe themselves (e.g., "I am an environmentalist"; Whitmarsh & O'Neill, 2010) reflecting a particular self-definition (see Gollwitzer, Wicklund, & Hilton, 1982). Self-identity has often been studied as an additional predictor of intention and behaviour in the context of the theory of planned behaviour (Ajzen, 1985, 1991). Some scholars initially argued against its predictive power, on the assumption that the variance explained by self-identity would already and more convincingly be covered by either past behaviour – as our sense of self relies to a great extent on the behaviours we adopt or do not adopt (Bem, 1967) – or values and attitudes (Sparks & Shepherd, 1992). Others argued that self-identity does not necessarily align with past behaviour, especially when a person considers adopting a new behaviour (Granberg & Holmberg, 1990). Additionally, self-identity can provide meaning for a behaviour independent of the attitude towards performing this behaviour. Hence, people may perform (or not) a behaviour, regardless of their attitude towards it, as far as this behaviour

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https://doi.org/10.1016/j.jenvp.2019.01.002
Received 27 April 2018; Received in revised form 7 January 2019; Accepted 7 January 2019
Available online 11 January 2019
0272-4944/

is in line (or not) with the aspired-to self-identity (e.g., Biddle, Bank, & Slavings, 1987). With regard to pro-environmental action, past research has shown that the more one self-identifies as an environmentalist, the higher one's intention to act in a green manner in the future, and the greener one's actual behaviour (Carfora, Caso, Sparks, & Conner, 2017; Sparks & Shepherd, 1992; Terry, Hogg, & White, 1999; Whitmarsh & O'Neill, 2010).

The link between self-identity and intention/behaviour is not, however, necessarily straightforward. First, self-identity was found to more strongly predict future behaviour when such behaviour was visible to others (Brick, Sherman, & Kim, 2017) – that is, when it fulfils a function of identity signalling – which suggests that the effect depends on the social context in which the person interacts. Second, several studies found past behaviour to moderate the effect of self-identity, the latter having a stronger influence on intention at *low* rather than *high* levels of past behaviour (e.g., Conner & McMillan, 1999; Smith et al., 2007). This suggests that self-identity plays a more important role when behaviour is not habitual or routinized (but see Charng, Piliavin, & Callero, 1988). Other studies, however, did not find such moderation effects (Terry et al., 1999; Åstrøm & Rise, 2001) or yielded mixed findings (Dean, Raats, & Shepherd, 2012). All in all, these findings seem to hint at the limits of self-identity's influence on intention and behaviour. In the next section, we rely on self-completion theory as a framework to delineate these boundary conditions.

1.2. Self-identity and the self-completion theory

Self-completion theory (Gollwitzer et al., 1982; Wicklund & Gollwitzer, 1982) draws from Lewin's notion of tension systems (Lewin, 1935) to explain goal-oriented behaviour. It states that as long as a person is committed to a self-defining or identity goal, a tension remains that motivates them to keep working towards the accomplishment of this goal. In other words, if an aspect of one's self-identity is perceived as incomplete, one will want to take action to remedy the situation. This can be done through various activities (i.e., self-symbolising efforts) geared towards indicating completeness (e.g., Gollwitzer, Marquardt, Scherer, & Fujita, 2013; Gollwitzer & Wicklund, 1985; Marquardt, Gantman, Gollwitzer, & Oettingen, 2016). Hence, a person should keep up such endeavours as long as the aspired-to self-definition is perceived as incomplete. However, once fulfilment of an identity-defining goal is achieved, a sense of self-completeness emerges, which leads to effort reduction (e.g., Gollwitzer, Sheeran, Michalski, & Seifert, 2009; Longoni, Gollwitzer, & Oettingen, 2014).

Accordingly, self-completion theory leads to the prediction that a given self-identity positively predicts striving, but mainly when this aspired-to identity is incomplete. If circumstances were to provide a feeling of self-completeness, self-identity would no longer be a relevant predictor. In the present research, we investigate whether past behaviour (more or less pro-environmental) and numerical support (majority or minority) interact to determine whether people consider their aspired-to self-definition as an environmentalist as complete or not, hence ultimately moderating the link between self-identity and behavioural intentions. The two following sections delineate our reasoning in more detail.

1.3. The effect of past behaviour on intention and behaviour

Past behaviours can influence future behaviours in two opposite ways. On the one hand, people tend to act consistently with their past deeds (Festinger, 1957; Kiesler, 1971), and habits have an important role in shaping consistent future behaviour (Dahlstrand & Biel, 1997; Stern, 2000; Triandis, 1977). Consistency can take two forms: a simple repetition of a given behaviour, and the adoption of different but related behaviours (i.e., positive spillover). Accordingly, past green behaviour has first been found to positively predict future performance of the same behaviour, for example household recycling (Carfora et al., 2017; Terry et al., 1999) and intentions to adopt several carbon offsetting behaviours (Whitmarsh & O'Neill, 2010). Second, adopting certain green behaviours also increases the probability of producing other green behaviours (e.g., recycling positively predicts avoiding package waste; Thøgersen, 1999), especially when these behaviours are perceived as more similar to each other (Thøgersen, 2004; see Truelove, Carrico, Weber, Raimi, & Vandenbergh, 2014, for a review).

On the other hand, people can also use past positive behaviour as moral credentials to balance subsequent negative behaviour, thus maintaining a positive self-image (i.e., self-licensing; Effron, 2016; see Blanken, van de Ven, & Zeelenberg, 2015, for a recent meta-analysis). For instance, participants increased their household energy consumption after having been told that they consumed less than their neighbours (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007), recycled less in a handicraft task after learning that their grocery shopping was more sustainable than average (Longoni et al., 2014), and were less likely to participate in a pro-environmental action after having been given the opportunity of signing a pro-environmental petition online (Schumann & Klein, 2015).

Self-completion theory can serve as a framework to predict when past behaviour informs individuals that their self-identity is (in)complete. Congruent past behaviours can be utilised as symbols of completeness (or moral credentials) and provide a sense of self-completeness that makes further efforts to keep up one's self-identity unnecessary, hence leading to relaxing efforts towards meeting the aspired-to identity-related goal (Longoni et al., 2014). This, however, would only be true to the extent that past behaviour is perceived as sufficient to complete the self. By contrast, individuals would persevere as long as their self is incomplete (see also Jordan, Mullen, & Murnighan, 2011). On this basis, we argue that social factors, such as numerical social support for the pro-environmental values, could determine whether past behaviour is deemed sufficient and translates into a feeling of completeness (or not).

1.4. Numerical (majority-minority) support for the pro-environmental values

Numerical support reflects the perception that either the majority or a minority of one's social group supports a given value or position, that is, the normativity of one's position. The social influence literature suggests that people are motivated to avoid deviance from their normative ingroup's positions (e.g., Asch, 1956; David & Turner, 1996; Deutsch & Gerard, 1955; Turner, 1991). Accordingly, the greater the belief that others adopt a behaviour, the higher the person's intention to adopt the same behaviour (e.g., Dean et al., 2012; Sparks & Shepherd, 1992). Congruently, learning that they are doing worse than a descriptive majority leads people to increase their efforts (a compensation effect; e.g., Longoni et al., 2014; Schultz et al., 2007; Toner, Gan, & Leary, 2014).

Social norms and majority positions do not, however, always lead to an increase of efforts. For instance, learning that they are doing better than their ingroup's average leads people to *reduce* their subsequent efforts (e.g., Brook, 2011; Longoni et al., 2014; Schultz et al., 2007). Conversion theory (Moscovici, 1980) consistently states that once their normativity is ensured, people no longer feel the need to pursue their efforts towards the majority's goals but instead slack off. As such, majority influence is often limited to a mere superficial compliance that only leads to weak attitude change, if any (Martin, Martin, Smith, & Hewstone, 2007), and hardly translates into long-term influence (see Butera, Falomir-Pichastor, Mugny, & Quiamzade, 2017; Martin & Hewstone, 2008; for reviews).

In contrast, social minorities, because they lack all normative power, are more likely to elicit a deeper elaboration of their positions and in turn – to the extent that they actively and relentlessly defend their positions – a “truer” influence (Moscovici, 1980). Minorities hence often produce greater attitude change and stronger behavioural

intentions (Martin et al., 2007). Moreover, minority groups elicit, overall, higher ingroup identification and satisfaction than majority groups (Leonardelli & Brewer, 2001), and their members are globally more cohesive, participative, and committed in defending the group's positions than majority groups members (e.g., Gerard, 1985; Levine & Moreland, 2006; Mullen, 1991). For example, supporters of minority political parties are more likely to proactively disseminate the party's ideas and discuss politics with their friends than supporters of majority parties (Abrams, 1994).

Hence, minority support seems more likely to motivate people to strive towards their goals and show consistency in their behaviour than majority support, which, contrariwise, seems more likely to elicit dynamics of self-licensing – that is, initial compliance with the majority goals quickly followed by a relaxation of efforts. In line with this reasoning, Lalot, Falomir-Pichastor, and Quiamzade (2018) investigated the effect of a past pro-environmental behaviour (versus a lack of pro-environmental behaviour) on future pro-environmental intentions as a function of majority-minority support. When a majority supported the environmental values, the authors observed lower intentions in the aftermath of past pro-environmental behaviour, in comparison with a lack of pro-environmental behaviour. In contrast, when a minority supported these values, intentions were higher following past pro-environmental behaviour, in comparison with a lack of pro-environmental behaviour.

Self-completion theory can account for this moderating effect of majority-minority support on the way people understand their past behaviour (in terms of goal completeness). Indeed, we know from the literature that majorities and minorities orient people towards different goals: Majorities orient the individual towards what must be done (Falomir-Pichastor, Mugny, Quiamzade, & Gabarrot, 2008) and prioritise duties over rights (Moghaddam, 2004). In other words, they trigger a representation of goals as obligations or *minimal goals* (Brendl & Higgins, 1996). Minorities, on the other hand, orient the individual towards an alternative to the status quo (i.e., an ideal that could be pursued) and prioritise rights over duties. As such, they trigger a representation of goals as ideals or *maximal goals*. Minimal and maximal goals differ not only with respect to their mandatory versus ideal nature, but also in terms of their absolute magnitude: minimal goals are lower than maximal goals (Brendl & Higgins, 1996). In consequence, they could more easily be considered fulfilled when considering past positive behaviour than maximal goals.

In sum, numerical support could change the inferences people draw from their past behaviour: Majority support, orienting people towards the realisation of a lower-level, mandatory, minimal goal, would facilitate an impression of goal- or self-completeness in light of past behaviour, and this resulting state of self-completeness would lead to self-licensing. Minority support, orienting people towards a higher-level, ideal, maximal goal, would make it less likely to feel self-complete in light of equivalent past behaviour, and this resulting state of self-incompleteness would trigger behavioural consistency. However, as mentioned above, minority support has an energising effect of people, fostering their motivation to advance the group positions (Gerard, 1985; Leonardelli & Brewer, 2001; Mullen, 1991). Accordingly, initial past green behaviour (i.e., behaviour in line with the goal) could boost motivation to keep striving towards the goal, as compared to a lack of such past behaviour. This boosted motivation would then increase the production of subsequent behaviours congruent with the goal. There is preliminary evidence suggesting that the effect of a minority support depends on the level of past green behaviours: Previous aforementioned work on the interactive effect of minority and past behaviour showed that under minority support, pro-environmental intentions were higher following past green-than past non-green behaviour (Lalot, Falomir-Pichastor, et al., 2018). This energising dynamics is compatible with the "goal looms larger" effect, which similarly describes how motivation can increase when people get close to (but have not reached yet) their goal (Förster, Higgins, & Idson, 1998).

2. Overview of the present research and hypotheses

2.1. Hypotheses

In summary, we have established so far that self-identity is positively linked to future intentions and behaviour, but that this link can be moderated by past behaviour. Specifically, the link can disappear at high levels of past behaviour, which is consistent with a self-completion perspective. Additionally, we have seen that majority-minority support can moderate the effect of past behaviour on future intentions and behaviour. More precisely, the detrimental effect of past positive behaviour on future behaviour (i.e., self-licensing) is more likely to occur when a numerical majority supports the person's past behaviour. This is, again, consistent with self-completion. In the present research, we propose to bring together these different perspectives and investigate the interactive effect of self-identity, past behaviour, and majority-minority support, on future pro-environmental intentions. We propose that past behaviour and majority-minority support together determine the individual's state of self-(in)completeness and thus moderate the strength of the relationship between self-identity and future action. Our hypotheses are as follow.

First, we expect an overall positive main effect of self-identity on the strength of behavioural intentions (H1). Second, we expect a 3-way self-identity × past behaviour × majority-minority support interaction (see Fig. 1). Specifically, when a majority supports one's pro-environmental values, past green behaviour should confer a state of self-completeness and weaken the effect of self-identity, in comparison with past "non-green" behaviour (H2). In other words, we expect a 2-way self-identity × past behaviour interaction in the majority support condition, so that the (simple) effect of self-identity would be weaker in the past green than the past non-green behaviour condition.

In contrast, when a minority supports one's pro-environmental values, past green behaviour should not suffice to attain self-completeness. Hence, according to self-completion theory, the self would remain incomplete regardless of the level of past behaviour, so self-identity should be positively related to intentions in both conditions of past behaviour. In addition, other research from the group processes literature indicates that minority support could boost motivation in the aftermath of past positive behaviour. With respect to these findings, and going beyond a mere self-completion account, we propose that the link between self-identity and intentions would be reinforced in the past green (as compared to non-green) behaviour condition. In other words, we expect a 2-way self-identity × past behaviour interaction in the minority support condition, so that the (simple) effect of self-identity would be positive overall, and get stronger in the past green-than the

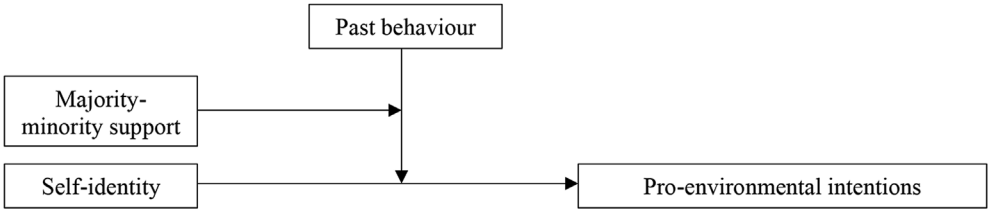

Fig. 1. Conceptual model of the hypothesised 3-way interaction effect between self-identity, past behaviour, and majority-minority support on pro-environmental intentions.

Table 1
Descriptive statistics and correlations between the independent and dependent variables measured in Study 1.

		M (*SD*)	Cronbach's α	Pearson's *r*		
				2	3	4
1	Green self-identity	5.33 (1.13)	.86	.43	.41	.63
2	Past green behaviours	−0.62 (0.60)	.77	–	.32	.39
3	DV1 – personal AC-use intention	5.07 (1.18)	.80		–	.59
4	DV2 – general personal intention	5.24 (1.36)	.92			–

Note. All measures used 7-point answer scales except the past green behaviours measure, on which a Rasch-type model was applied, resulting in scores ranging from −2.89 to 0.62.
All correlations are significant at $p < .001$.

past non-green behaviour condition (H3).

2.2. Overview of the present research

We present four studies in which we measured participants' green self-identity and considered its effect on relevant intentions in interaction with *a)* past green behaviour, self-reported (Study 1), or manipulated through induced representations of own past behaviour (Study 2) or alternatively through a bogus feedback procedure (Studies 3 & 4), and *b)* majority-minority support either manipulated (Studies 1 & 2) or measured (Studies 3 & 4).

Based on relevant findings in the identity strength and self-concept literature, we decided to systematically measure and not manipulate self-identity. Strength of identity corresponds to a stronger and better-defined self-concept (Markus, 1977); research shows that people with a well-defined self-concept are less – or not at all – influenced by contextual information that would conflict with their self-concept (Chaiken & Baldwin, 1981; Markus & Kunda, 1986) and can even actively oppose this information (Swann & Hill, 1982). Yet, in the present research we focus especially on such individuals with a strong green identity. Were we to try and manipulate self-identity contextually, we would run the risk of impacting mostly participants with a weak initial self-identity while those with a stronger self-identity would not be influenced and would still act according to their initial self-identity, regardless of the contextual manipulation. In order to avoid some participants not being sensitive to (or not believing in) a "low identity" manipulation and still behaving according to their high green identity even in the low green identity condition, we decided to focus on measures of initial green self-identity.

As the environmental topic of interest, we chose to focus on household energy consumption as this domain has been identified as one of the most relevant for behaviour change (high plasticity and large potential impact on carbon emissions; see Dietz, Gardner, Gilligan, Stern, & Vandenbergh, 2009). We addressed both personal behavioural intentions (Study 1) and collective action intentions (Studies 2–4).

3. Study 1

3.1. Method

3.1.1. Participants and design

Two hundred twenty-seven American participants were recruited through Amazon's MTurk and remunerated for their participation. They were 121 males and 105 females (one undisclosed) of an average age of 36.9 years ($SD = 12.6$). The study adopted a 2 (numerical support: minority vs. majority) × continuous (past green behaviour) × continuous (green self-identity) design and participants were randomly allocated to one condition of numerical support (minority: $n = 109$; majority: $n = 118$). Sensitivity power analyses indicated that the sample size was sufficient to detect a small-size three-way interaction effect (Cohen's $d = 0.37$) at 80% power level. At the end of this study as with the following ones, participants were thoroughly debriefed; they all confirmed their consent to the use of their data.

3.1.2. Independent variables

3.1.2.1. Green self-identity. The questionnaire started with the assessment of participants' green self-identity with five items adapted from previous research (Sparks & Shepherd, 1992; Whitmarsh & O'Neill, 2010): "I think of myself as someone who is concerned by the environmental issues", "I am a person who supports sustainable development", "I am a person who supports renewable energies", "I see myself as someone with an environmental awareness", and "I consider myself green." Responses (7-point scale, 1 = not at all, 7 = very much) loaded on a single factor in an exploratory factorial analysis and showed good internal reliability; we therefore aggregated these items. Descriptive statistics and correlations with other measures are reported in Table 1.

3.1.2.2. Numerical support manipulation. A manipulation of numerical support for the pro-environmental values followed. Participants read a short text allegedly reporting the results of a recent opinion poll assessing "Americans' stance on environmental issues." Depending on the experimental condition, the text stated that "[Most/Few] Americans are concerned for the environment, view protecting the environment as a top priority, say they try to live in ways that protect the environment; and [a majority/a minority] of Americans do recycle." For each statement, a specific percentage of people was reported, ranging from 61% to 82% in the majority support condition and from 4% to 18% in the minority condition. In addition, a graph illustrated the results reported in the text. Manipulations are reproduced in Appendices A.1 and A.2.

The manipulation effectiveness was pretested in a pilot study (American MTurkers, $N = 50$). Participants of the pilot study were exposed to the numerical support manipulation, then indicated whether, according to them, "the percentage of Americans 'concerned about the environment' represented a minority or a majority of people" (1 = a very small minority of people, 7 = a very large majority of people), and whether this percentage "represented few people or many people" (1 = very few people, 7 = very many people). As the correlation between the two measures was quite strong, $r(49) = 0.92$, $p < .001$, we computed an average score ($M = 3.86$, $SD = 2.17$). A one-way ANOVA found a strong effect of the support manipulation on the check measure, $F(1, 48) = 145.6$, $p < .001$, $\eta_p = .75$ (minority condition: $M = 2.00$, $SD = 0.96$; majority condition: $M = 5.72$, $SD = 1.21$). Moreover, we wanted to ensure that participants really memorised the information they read and did not simply repeat it right after reading. Hence, after completing other unrelated questionnaires for a duration of approximatively 5 min (which corresponds to the average duration of the main study), they were asked to indicate the percentage of Americans who, according to them, "do efforts to protect the environment" and "think it's important to protect the environment." Again, answers were strongly correlated, $r(49) = 0.89$, $p < .001$, and we aggregated them ($M = 51.7\%$, $SD = 25.4$). A one-way ANOVA similarly found a strong effect of the support manipulation on this measure, $F(1, 48) = 113.4$, $p < .001$, $\eta_p^2 = .70$ (minority condition: $M = 30.5\%$, $SD = 12.9$; majority condition: $M = 72.8\%$, $SD = 15.1$). Hence, the numerical support manipulation can be considered effective.

3.1.2.3. Green past behaviours measure. We measured participants' past green behaviours through the 50-item General Environmental Behaviours Scale (GEB; Kaiser & Wilson, 2004). The GEB measures a variety of environmental behaviours, some relatively easy to adopt (e.g., "I collect and recycle used paper"), and others requiring more effort (e.g., "I contribute financially to environmental organisations").

Thirty-six items are measured on a 5-point scale (1 = never, 5 = always) and 14 with a binary response (1 = yes, 2 = no). A "non-applicable" answer is available for all items. Following Kaiser and Wilson (2004)'s recommendations and using ACER Quest (Adams & Khoo, 1996), we applied a Rasch-type model on the data, so that individuals' environmental score would take into account their overall performance level as well as the difficulty of each specific (endorsed and non-endorsed) behaviour (see Table 1).[1]

3.1.3. Dependent variables

3.1.3.1. Specific personal intention: air conditioning use. Participants then stated their personal pro-environmental behavioural intention. We first questioned them on the issue of using air conditioners (hereafter, AC). Following a brief description of the impact of household air conditioning use in the US, participants rated to what extent they were willing to monitor and reduce their AC-related energy consumption over the upcoming summer (7-point scale, 1 = not at all, 7 = very much, e.g., "turn the AC down when I am not home during the day"; see Table 1). [2]

3.1.3.2. General pro-environmental personal intention. Five additional questions assessed a more general intention to make efforts to protect the environment (e.g., "You intend to adopt more pro-environmental behaviours"). An exploratory factorial analysis with all intention items (oblique rotation) suggested two factors corresponding to general personal intentions (Factor 1) and specific AC-use intentions (Factor 2); as a result, we considered these as separate dependent measures. Loadings of the factorial analysis and wordings of all items are reported in Appendix B.

3.2. Results

3.2.1. Specific behavioural intention: AC use

Numerical support (minority vs. majority), green credentials (standardised), green self-identity (standardised) and all their interactions were entered as predictors in a full-factorial ANCOVA with AC-related intentions strength as the dependent variable (corrected model: $F(7, 219) = 9.48$, $p < .001$, $\eta_p^2 = .23$). The model revealed a significant main effect of self-identity, $F(1, 219) = 19.6$, $p < .001$, $\eta_p^2 = .08$, such that stronger self-identity predicted stronger intentions (H1); as well as a significant main effect of past behaviour, $F(1, 219) = 4.84$, $p = .029$, $\eta_p^2 = .022$, such that more frequent past green behaviour predicted stronger intentions. There was also a 2-way self-identity × past behaviour interaction, $F(1, 219) = 7.36$, $p = .007$, $\eta_p^2 = .032$, which was qualified by the expected 3-way interaction, $F(1, 219) = 5.31$, $p = .022$, $\eta_p^2 = .024$ (see Fig. 2a). No other effects reached significance, $F_s < 1.67$, $p_s > .20$.

We decomposed the 3-way interaction by testing the 2-way self-identity × past green behaviour interaction in each condition of numerical support. This interaction was significant in the majority support condition, $\beta = -0.38$, $b = -0.38$, 95% CI [-0.65, −0.12], $t(219) = -2.85$, $p = .005$ (H2), but not in the minority condition, $\beta = -0.03$, $b = -0.03$, 95% CI [-0.17, 0.11], $t(219) = -0.43$, $p = .67$ (H3). Consistent with our second hypothesis, in the majority condition, self-identity predicted personal intentions amongst participants reporting less frequent past green behaviours (-1 *SD*), $\beta = 0.55$, $b = 0.65$, 95% CI [0.33, 0.97], $t(219) = 4.05$, $p < .001$, but not amongst those reporting more frequent behaviours (+1 *SD*), $\beta = -0.10$, $b = -0.11$, 95% CI [-0.49, 0.26], $t(219) = -0.59$, $p = .56$. In the minority condition, the self-identity/intention link was positive and significant but, contrary to our third hypothesis, it did not depend on the level of past behaviour, respectively for less frequent past green behaviour, $\beta = 0.39$, $b = 0.46$, 95% CI [0.22, 0.70], $t(219) = 3.78$, $p < .001$, for more frequent behaviour, $\beta = 0.33$, $b = 0.39$, 95% CI [0.12, 0.67], $t(219) = 2.87$, $p = .004$.

To ensure that the abolished self-identity effect amongst people reporting greener past behaviour was restricted to the majority support condition, we additionally compared the self-identity slopes at high and low levels of past green behaviour (+1 and −1 *SD*, respectively) between conditions of majority and minority support. *Z*-scores were calculated based on the slopes' betas and *SE*. At low past green behaviours (−1 *SD*), the self-identity slopes did not differ between the majority and minority support conditions, *z*-score = 0.94, $p = .35$. In contrast, at high past green behaviours (+1 *SD*), the slope was significantly lower in the majority than minority support condition, *z*-score = 2.14, $p = .032$.

3.2.2. General pro-environmental personal intention

The same model was then run on general pro-environmental intentions (overall model: $F(7, 219) = 25.5$, $p < .001$, $\eta_p^2 = .45$). Consistent with the previous analysis, this model revealed a significant main effect of both self-identity, $F(1, 219) = 90.3$, $p < .001$, $\eta_p^2 = .29$ (H1), and past green behaviour, $F(1, 219) = 4.28$, $p = .040$, $\eta_p^2 = .019$. The self-identity × past behaviour interaction was also significant, $F(1, 219) = 7.67$, $p = .006$, $\eta_p^2 = .034$, and the numerical support × past behaviour approached significance, $F(1, 219) = 2.93$, $p = .088$, $\eta_p^2 = .013$. Again, these were qualified by the expected 3-way interaction, $F(1, 219) = 4.03$, $p = .046$, $\eta_p^2 = .018$ (see Fig. 2b). No other effects reached significance, $F_s < 1.01$, $p_s > .31$.

We tested again the two-way self-identity × past green behaviour interaction in each condition of numerical support. Again, this interaction was significant in the majority support condition, $\beta = -0.31$, $b = -0.36$, 95% CI [-0.61, −0.10], $t(219) = -2.72$, $p = .007$ (H2), but not in the minority condition, $\beta = -0.05$, $b = -0.06$, 95% CI [-0.20, 0.08], $t(219) = -0.80$, $p = .43$. Consistent with our second hypothesis, in the majority condition self-identity predicted personal intention at low level of past green behaviours (−1 *SD*), $\beta = 0.75$, $b = 1.02$, 95% CI [0.71, 1.33], $t(219) = 6.47$, $p < .001$, but not at high level of past behaviours (+1 *SD*), $\beta = 0.23$, $b = 0.31$, 95% CI [-0.06, 0.67], $t(219) = 1.65$, $p = .100$. In the minority condition, the self-identity/intention link was positive regardless of past behaviour, respectively for less frequent past green behaviour, $\beta = 0.63$, $b = 0.85$, 95% CI [0.62, 1.08], $t(219) = 7.20$, $p < .001$, for more frequent past green behaviour, $\beta = 0.54$, $b = 0.74$, 95% CI [0.47, 1.00], $t(219) = 5.50$, $p < .001$. Finally, at low level of past behaviour, the self-identity slopes did not differ between the majority and minority support conditions, *z*-score = 0.87, $p = .39$. In contrast, at high level of past behaviour, the slope was significantly lower in the majority than the minority support condition, *z*-score = 2.14, $p = .030$.

3.3. Discussion

This first study provided initial evidence that past green behaviour and numerical support conjointly moderate the link between self-identity and relevant behavioural intentions. As expected, self-identity positively predicted green intentions overall (H1), but this link disappeared under certain conditions: when the person reported greener past behaviour (hence presumably benefiting from green credentials) and a majority supported their pro-environmental values (i.e., when feelings of self-completeness should be established; H2). Regarding minority support (when feelings of self-incompleteness should be more salient), we expected past green behaviour to reinforce the link between self-identity and intention in the minority support condition (H3); this

[1] In a Rasch model, item "difficulty" is estimated in a first step of scaling based on the answers on the entire sample, more specifically on the proportion of respondents who self-attributed (or not) the item in question. Personal scores are then computed with respect to this scaling.

[2] We ensured that most participants owned an air conditioner at home (yes/no question; 97% did). Exclusion of the participants *not* owning an AC did not change the pattern of results observed.

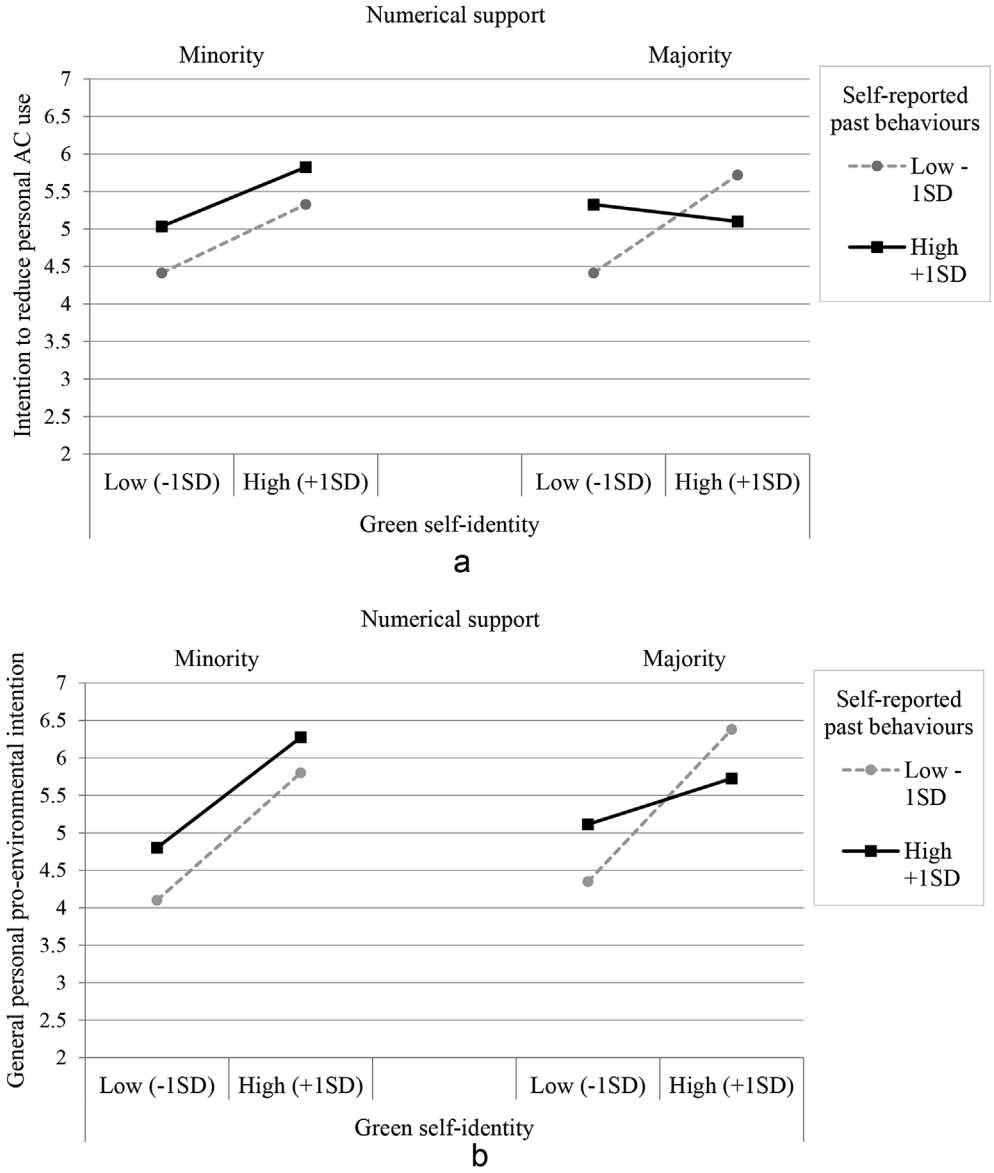

Fig. 2. a. Strength of intention to reduce personal use of air conditioners over the summer (7-point scale) as a function of green self-identity, past green behaviour, and numerical support (Study 1). **b**. Strength of general personal pro-environmental intention (7-point scale) as a function of green self-identity, past green behaviour, and numerical support (Study 1).

however was not supported by our data. Instead, the link was positive regardless of past behaviour.

A limitation of the present study is that both self-identity and past behaviour were measured. Hence, the following studies tried to manipulate past green behaviour through various procedures. Moreover, in order to better understand the specificities of majority versus minority support, Study 2 included a control condition with no numerical support information. Finally, to increase the validity of the present findings, we further investigated another dependent variable and focused on intention to participate in a pro-environmental collective action. As environmental issues are a global challenge, collective actions are badly needed in order to effectively tackle them (Bamberg, Rees, & Seebauer, 2015; see also; Van Zomeren, 2013). The proposed collective action was still related to the topic of energy consumption and took the form of a "Zero Power Day" (see details below).

4. Study 2

4.1. Method

4.1.1. Participants and design

Undergraduate psychology students from a European university took part in the study in exchange for course credits. A total of 286 students answered a paper-and-pencil questionnaire. Nine had to be excluded from the analyses: five because they returned the questionnaire after less than 5 min (when most participants needed 15–20 min) and four because they circumvented the green credentials manipulation, crossing and hand-writing some frequency labels (see below). The final sample included 277 participants (58 male and 219 female) of a mean age of 20.6 (SD = 3.81). Sensitivity power analyses indicated that the sample size was sufficient to detect a small-size three-way interaction effect (d = 0.38) at the 80% power level. The study adopted a 3 (numerical support: minority vs. majority vs. no information) × 2 (past behaviour: low vs. high) × continuous (green self-identity) design and participants were randomly allocated to

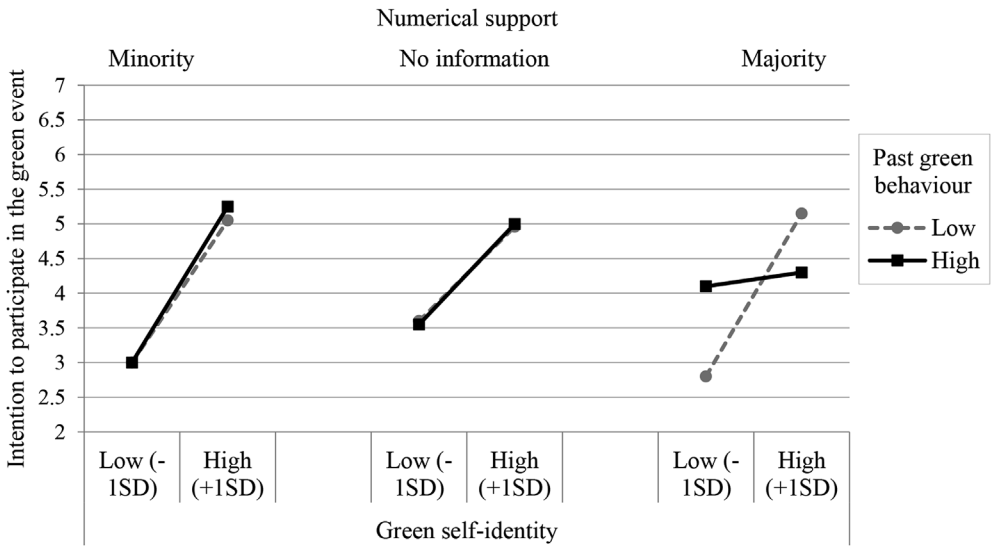

Fig. 3. Strength of intentions to participate in the pro-environmental event (7-point scale) as a function of green self-identity, numerical support, and past green behaviour (Study 2).

experimental conditions. *N* per condition ranged from 44 to 47.

4.1.2. Independent variables

4.1.2.1. Green self-identity. Green self-identity was measured with the same items as in Study 1 ($\alpha = 0.90$, $M = 4.49$, $SD = 1.23$).

4.1.2.2. Numerical support. As this study introduced a control condition, we adapted the manipulation so that the content presented could be free of any numerical support information. Thus, participants were asked to read a 400-word newspaper-like text on environmental issues, more precisely on the regional situation of energy overconsumption. The numerical support manipulation consisted in a prelude informing that a representative sample of the local population had been surveyed following the publication of this newspaper article. Depending on the experimental condition (minority vs. majority), it was said that "12% (88%) of the sampled people declared supporting the content of the text without hesitation, and committed themselves to make more individual efforts in order to reduce their own consumption. Thus, only a minority (a large majority) of the inhabitants unconditionally supports the pro-environmental values." In the control condition, the text was presented without any information about numerical support. Texts are reproduced in Appendices C.1 and C.2.

4.1.2.3. Past green behaviour manipulation. Representation of past green behaviour was manipulated through 12 items assessing personal green habits (7-point scale, 1 = not at all, 7 = very much). Drawing from work on attitude inference (Salancik & Conway, 1975) and moral credentials (Lacasse, 2016; Monin & Miller, 2001), statements were associated with specific frequency adverbs (i.e., "sometimes" and "very often"). Specifically, in the high green behaviour condition, pro-environmental statements were labelled "sometimes" (e.g., "At home, I *sometimes* recycle paper") and counter-environmental statements were labelled "very often" (e.g., "I *very often* omit to turn out the light when I leave a room") so it would be easier to tick more extreme numbers on the scale and, in turn, infer a representation of past behaviour as greener. Adverbs were reversed in the low green behaviour condition (e.g., "At home, I *very often* recycle paper", "I *sometimes* omit to turn out the light when I leave a room"). After recoding reverse items, mean answer to the 12 items was higher in the high ($M = 4.87$, $SD = 0.73$) than the low behaviour condition ($M = 4.66$, $SD = 0.92$), $F(1, 271) = 4.54$, $p = .034$, $\eta_p^2 = .016$, indicating that the manipulation was successful. All items are reported in Appendix D.

4.1.3. Dependent measure: strength of intention to participate in a pro-environmental action

After the experimental manipulations, participants were introduced to a pro-environmental event supposedly organised by a local association, "Zero Power Day." The aim of the event was to help participating individuals to achieve near-zero energy consumption for 24 h (e.g., no computer, phone, TV or radio), in an effort to increase awareness and reduce energy consumption. Inspired by the collective action literature (Zaal, Van Laar, Ståhl, Ellemers, & Derks, 2012), four items measured the intention to participate in the event: "To what extent would you *(1)* sign a petition in favour of this event, *(2)* subscribe to a newsletter related to this event, *(3)* become a support member of the organisation team, and *(4)* take part in this event yourself?" (7-point scale, 1 = not at all, 7 = very much). Items loaded on a single factor in an exploratory factorial analysis and were thus aggregated ($\alpha = 0.88$, $M = 4.16$, $SD = 1.52$).

4.2. Results

Numerical support (minority vs. majority vs. no information), representation of past green behaviour (low vs. high), green self-identity (standardised) and all their interactions were entered as predictors in a full-factorial ANCOVA with intention strength as the dependent variable (corrected model: $F(11, 265) = 10.4$, $p < .001$, $\eta_p^2 = .302$). The analysis yielded a significant main effect of self-identity, $F(1, 265) = 84.9$, $p < .001$, $\eta_p^2 = .243$, so that a stronger self-identity predicted stronger intentions (H1). The self-identity × past behaviour interaction was marginally significant, $F(1, 265) = 3.26$, $p = .072$, $\eta_p^2 = .012$, as well as the self-identity × numerical support interaction, $F(2, 265) = 2.35$, $p = .097$, $\eta_p^2 = .017$. More importantly, and as expected, the 3-way interaction was significant, $F(2, 265) = 4.29$, $p = .015$, $\eta_p^2 = .031$ (see Fig. 3). No other effects reached significance, $F_s < 0.84$, $p_s > .43$.

As in the previous study, we decomposed the 3-way interaction by testing the 2-way self-identity × past behaviour interaction in each condition of numerical support. This interaction was significant in the majority support condition, $\beta = -0.32$, $b = -0.49$, 95% CI [-0.78, −0.20], $t(269) = -3.28$, $p = .001$ (H2), but not in the minority condition, $\beta = 0.02$, $b = 0.03$, 95% CI [-0.24, 0.31], $t(269) = 0.24$, $p = .81$ (H3), or the control condition, $\beta = 0.01$, $b = 0.02$, 95% CI [-0.23,

0.28], $t(269) = 0.17$, $p = .87$. Consistent with our second hypothesis, in the majority condition self-identity predicted willingness to act in the low past behaviour condition, $\beta = 0.71$, $b = 1.08$, 95% CI [0.70, 1.45], $t(269) = 5.70$, $p < .001$, but not in the high past behaviour condition, $\beta = 0.07$, $b = 0.10$, 95% CI [-0.35, 0.55], $t(269) = 0.43$, $p = .67$. In the minority condition, the self-identity/intention link was positive regardless of past behaviour, respectively for low past behaviour, $\beta = 0.62$, $b = 0.95$, 95% CI [0.56, 1.33], $t(269) = 4.83$, $p < .001$, for high past behaviour, $\beta = 0.67$, $b = 1.02$, 95% CI [0.63, 1.40], $t(269) = 5.18$, $p < .001$.

Finally, we compared the self-identity slopes for each condition of past green behaviour between conditions of majority and minority support. We did not include the control "no information" condition in the comparison as we did not have a specific hypothesis for it. *Z*-scores were again calculated based on the slopes' betas and *SE*. In the low past behaviour condition, the self-identity slopes did not differ between the majority and minority support conditions, *z*-score = 0.47, $p = .32$. In contrast, in the high past behaviour condition, the slope was significantly lower in the majority than minority support condition, *z*-score = 3.02, $p = .001$.

4.3. Discussion

First of all, the second study replicated the positive link between self-identity and intention (H1). More importantly, it provided additional evidence that past green behaviour and numerical support moderate the self-identity/intention link. Notably, self-identity ceased to be a significant predictor specifically when the person was led to consider their past behaviour as greener and a majority supported their pro-environmental values (H2). This was found while relying on a past behaviour manipulation and investigating a different dependent variable (i.e., collective action intention). Moreover, the inclusion of a control condition with no information regarding numerical support ensured that the loss of the self-identity effect was due to the majority support specifically. Finally, regarding the minority condition, the hypothesised strengthened link between self-identity and intentions after past green (vs. non-green) behaviour (H3) was again not supported by the data, which instead indicated a positive link irrespective of the level of past green behaviour.

The attitude inference paradigm used in this study has the advantage of being a subtle manipulation of past behaviour. However, with this manipulation, participants' perception of their past behaviour depends not only on the labels we introduced but also on the answers they gave under these labels. In consequence, the manipulation can also convey the effect produced by inter-individual differences. The fact that the manipulation check only revealed a small effect might be related to this special feature of our manipulation. In order to address this limitation, the next studies adopted a different manipulation – a bogus feedback procedure. In the next two studies, we also switched from manipulating numerical support to asking participants to indicate what proportion of a relevant ingroup they thought supported these values, which allowed us to study how one's *perception* of numerical support will determine pursuit of one's aspired-to environmentalism goal.

5. Study 3

5.1. Method

5.1.1. Participants and design

University students from a European university were contacted by email and asked to participate in an online study. Two hundred and one participants (51 male) completed the study, with a mean age of 24.7 ($SD = 8.35$). Sensitivity power analyses indicated that the sample size was sufficient to detect a 3-way interaction of small-to-medium size ($d = 0.44$) at 80% power level. The study adopted a 3 (subjective numerical support: minority vs. "about half" vs. majority) × 2 (past behaviour feedback: negative vs. positive) × continuous (green self-identity) quasi-experimental design. Participants were randomly allocated to one of the two experimental conditions of feedback (positive: $n = 97$; negative: $n = 104$).

5.1.2. Independent variables

5.1.2.1. Green self-identity. Green self-identity was measured as in previous studies (5 items, $\alpha = 0.91$, $M = 5.07$, $SD = 1.34$).

5.1.2.2. Subjective numerical support. Participants indicated the proportion of students from their university who they thought would be "supporting the environmental values and the principle of energy preservation." University students were chosen as the comparison target as we considered them to be a meaningful ingroup for the participants. Participants indicated whether they thought pro-environmental values were supported by a "majority" ($n = 62$), "minority" ($n = 55$) or "about half" ($n = 84$) of these students.[3] The "about half" answer possibility was added in order to avoid forcing participants into a dichotomous majority/minority choice and, instead, allow them to refuse to attribute the position to either a majority or a minority. Indeed, dichotomous choices are known to suffer several limitation (e.g., Krosnick & Presser, 2010); for example, they do not permit knowing if participants really chose the selected option or simply refused to pick the other one. However, this "about half" answer can obviously not be considered as a control condition strictly speaking. Be as it may, we do not know if participants choosing the "about half" option did so because they were uncertain, because they did not want to take a stand, or because they truly believed support for the environmental values is a fifty-fifty distribution. Hence, we present the results for this option alongside those of majority and minority support for information purposes only.

5.1.2.3. Feedback on past green behaviours. Participants answered the 12-item green behaviour scale used in Study 2 (no frequency adverbs were used this time), and then received a bogus feedback allegedly based on their answers. The feedback defined the participant's position relative to an official environmental standard, labelling their past behaviours as either low or high. Depending on the experimental condition (negative vs. positive feedback), participants were told that they were "below (above) the benchmark recommended by the Office of Sustainable Development, which means [they] engage in less (more) pro-environmental behaviours than would be expected from [them]."

5.1.3. Dependent measure

The same event as in Study 2 (i.e., Zero Power Day) was used here, and participants indicated to what extent they intend to participate in the event ($\alpha = 0.87$, $M = 4.26$, $SD = 1.72$).

[3] One could fear that participants' perception of numerical support depends on their green self-identity, as people could show a false-consensus bias and overestimate the proportion of persons holding opinions similar to theirs. Indeed, in the present study, self-identity scores were higher amongst participants who perceived support as a majority ($M = 5.37$, $SD = 0.99$) or about half of the inhabitants ($M = 5.26$, $SD = 1.21$) than amongst those who perceived support as a minority ($M = 4.67$, $SD = 1.61$), $F(2, 198) = 5.23$, $p = .006$, $\eta_p^2 = .050$. However, in Study 4, self-identity scores were not a function of whether participants perceived support as a majority ($M = 5.55$, $SD = 0.88$), minority ($M = 5.43$, $SD = 0.86$), or about half of the inhabitants ($M = 5.44$, $SD = 0.86$), $F(2, 370) = 1.07$, $p = .34$, $\eta_p^2 = .006$. Let us note also that Studies 1 and 2 manipulated numerical support and hence were protected from an identity-support confound. As a result, one can conclude that the relation between these two variables, as it appears specifically in Study 2, cannot explain the present pattern of results.

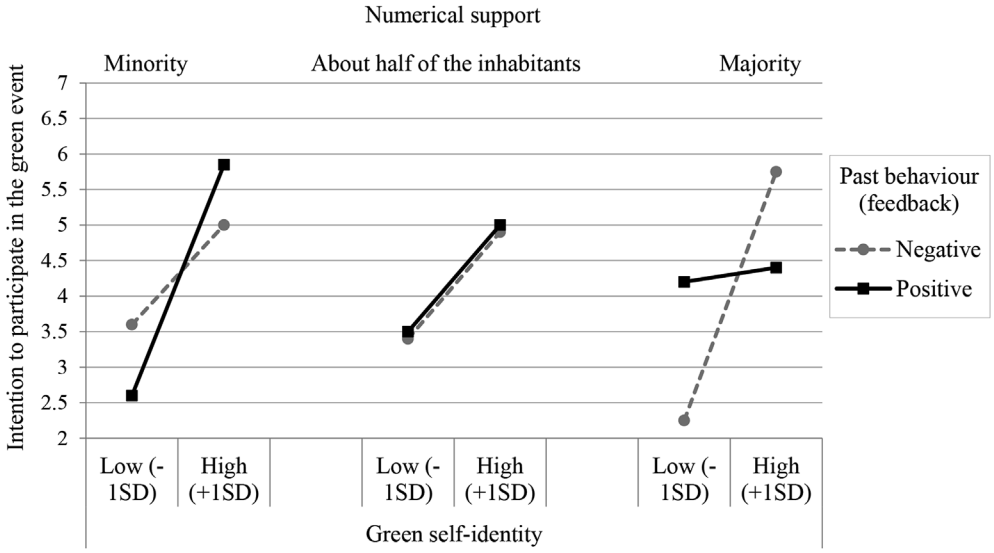

Fig. 4. Willingness to participate in the pro-environmental event (7-point scale) as a function of green self-identity, numerical support, and past behaviour (Study 3).

5.2. Results

We conducted a numerical support (majority vs. "about half" vs. minority) × past behaviour (positive feedback vs. negative feedback) × green self-identity (standardised) full-factorial ANCOVA including all interactions (corrected model: $F(11, 189) = 5.00$, $p < .001$, $\eta_p^2 = .225$). The main effect of self-identity was significant, $F(1, 189) = 41.2$, $p < .001$, $\eta_p^2 = .179$, indicating that stronger green self-identity led to a greater willingness to participate in the event (H1). The expected 3-way interaction was also significant, $F(2, 189) = 5.59$, $p = .004$, $\eta_p^2 = .056$ (see Fig. 4). No other effects reached significance, $F_s < 0.67$, $p_s > .41$.

Decompositions showed that the past behaviour × self-identity effect was significant in the majority condition, $\beta = -0.43$, $b = -0.75$, 95% CI [-1.29, −0.21], $t(193) = -2.75$, $p = .006$ (H2), marginal in the minority condition, $\beta = 0.25$, $b = 0.43$, 95% CI [-0.01, 0.88], $t(193) = 1.91$, $p = .058$ (H3), and non-significant in the intermediate ("about half of the students") condition, $\beta = -0.01$, $b = -0.01$, 95% CI [-0.39, 0.37], $t(193) = -0.05$, $p = .96$. Consistent with the pattern of results of the previous studies, in the majority condition, self-identity predicted willingness to act when the feedback on past behaviour was negative, $\beta = 0.90$, $b = 1.59$, 95% CI [0.76, 2.42], $t(193) = 3.78$, $p < .001$, but this link disappeared when the feedback was positive, $\beta = 0.05$, $b = 0.08$, 95% CI [-0.61, 0.77], $t(193) = 0.24$, $p = .81$. In the minority condition (although the interaction was only marginal), the pattern was reversed and corresponded with our third hypothesis: the link between self-identity and willingness to act was somewhat stronger in the positive, $\beta = 0.85$, $b = 1.50$, 95% CI [0.69, 2.30], $t(193) = 3.67$, $p < .001$, than in the negative feedback condition, $\beta = 0.36$, $b = 0.63$, 95% CI [0.25, 1.02], $t(193) = 3.25$, $p = .001$. In the intermediate ("about half") condition, the self-identity/intention link was significant and positive, $\beta = 0.39$, $b = 0.68$, 95% CI [0.30, 1.06], $t(193) = 3.53$, $p = .001$. Finally, we compared the strength of the self-identity slope between minority and majority support across each condition of feedback. In the positive feedback condition, the self-identity slope was significantly greater in the minority than the majority condition, z-score = 2.63, $p = .004$. In the negative feedback condition, in contrast, the slope was significantly greater in the majority than minority condition, z-score = 2.07, $p = .019$.

5.3. Discussion

Our third study confirmed, first, that self-identity was linked to intention (H1), and second, that the combination of majority support and past green behaviour (highlighted by a positive feedback) undoes the positive relation between green self-identity and pro-environmental intention (H2). This time, a marginal pattern of findings emerged in the minority support condition and, congruent with our third hypothesis, suggested that past green behaviour reinforces the self-identity/intention relation when a minority supports the person's environmental values (H3). This "energising" impact of the minority support following past green behaviour unfortunately does not seem so reliable, as it appeared nonsignificant in the first two studies and was only marginally significant in the third one. A possibility is that this effect, which was predicted by group processes literature, only emerges when the levels of past behaviour being compared are made explicit and maximise the distance between sufficient and insufficient past behaviour. This would explain why the result appears when we rely on an explicit manipulation of past behaviour, but not when the manipulation is more subtle or when past behaviours are merely measured as in Studies 1 and 2 (in which cases a global self-incompleteness dynamics seems to be at play regardless of the level of past behaviour). To test this possibility, we conducted a fourth and final study in which we tried to improve our operationalisation of past behaviour. As Studies 2 and 3 focused on a binary view of past behaviour (i.e., positive vs. negative), Study 4 went a step further by differentiating four categories: very negative, somewhat negative, somewhat positive, and very positive past green behaviours. We drew from the minimal and maximal goals literature to formulate our specific hypotheses.

6. Study 4

As mentioned earlier, literature distinguishes between minimal goal, that is, "the lowest goal whose end state will still produce satisfaction," and maximal goal, that is, an ideal one "hopes to approximate but does not necessarily expect to reach" (Brendl & Higgins, 1996, p. 104). These two types of goals can coexist and their relative salience depends on contextual cues or individual characteristics (Lalot, Quiamzade, & Falomir-Pichastor, 2018). It is also suggested that minimal and maximal goals differ in the way they are conceived: minimal goals are perceived dichotomously (i.e., either fulfilled or not fulfilled), whereas maximal goals are perceived in a gradual manner with respect to the discrepancy between the current position and the goal (Berthold, Mummendey, Kessler, Luecke, & Schubert, 2012; Fritsche, Kessler, Mummendey, & Neumann, 2009; Kessler et al., 2010).

Because majority support orients a person towards minimal goals

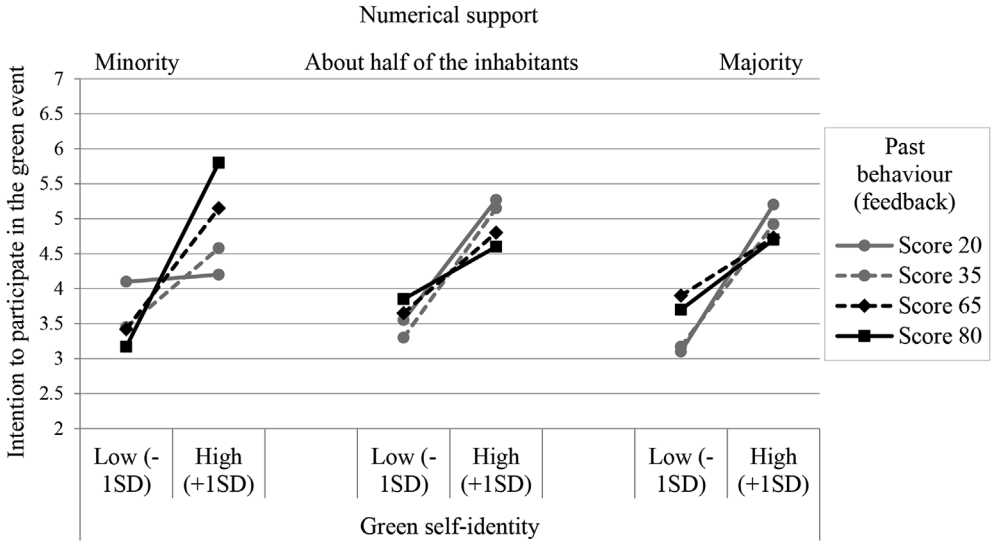

Fig. 5. Intention to participate in the pro-environmental event (7-point scale) as a function of green self-identity, estimated numerical support, and past behaviour (Study 4).

(Falomir-Pichastor et al., 2008), we propose that it will create a dichotomous perception according to which the goal is either reached or not reached. As a consequence, with regard to our second hypothesis, the distance between the participant's position and the goal should play no role when support is a majority: self-identity should positively and similarly predict behavioural intentions when past behaviour is slightly negative or very negative, and the link should weaken to a similar extent when past behaviour is slightly positive or very positive.

On the other hand, as minority support orients towards the realisation of maximal goals (Falomir-Pichastor et al., 2008), it should create a gradual perception of the discrepancy between the actual position and the goal. As such, and with respect to our third hypothesis, when support is a minority, the link between self-identity and behavioural intentions should gradually increase with the positivity of past behaviour, from very negative to slightly negative, slightly positive, and very positive. Importantly, this gradual hypothesis would explain why previous studies, which only compared two positions close to each other – slightly positive versus slightly negative – had difficulties showing an effect of past behaviour in the minority support conditions, whereas the effect was clear in the majority support conditions.

6.1. Method

6.1.1. Participants and design

American participants were recruited through Amazon's MTurk and remunerated for their participation. A total of 373 participants (155 male) completed the online study, with a mean age of 32.8 (SD = 11.8). The majority of respondents self-described as employees (50%) while the rest identified as students (23%), non-workers (20%), retired (4%) and employers (3%). Sensitivity power analyses indicated that the sample size was sufficient to detect a small-size three-way interaction effect (d = 0.39) at 80% power level. The study adopted a 3 (numerical support: minority vs. "about half" vs. majority) × 4 (past behaviour: feedback score of 20 vs. 35 vs. 65 vs. 80) × continuous (green self-identity) quasi-experimental design. Participants were randomly allocated to one of the four conditions of past behaviour (N per condition ranging from 92 to 95).

6.1.2. Independent variables

6.1.2.1. Green self-identity. Green self-identity was measured as in previous studies (5 items, α = 0.79, M = 5.44, SD = 0.86).

6.1.2.2. Subjective numerical support. Participants indicated the proportion of inhabitants from their state of residence who, according to them, was supporting environmental values. As in Study 3, participants indicated whether support was a "majority" (n = 91), "minority" (n = 160) or "about half" of the inhabitants (n = 122).

6.1.2.3. Feedback on past green behaviour. To increase the feedback's credibility, participants had to rate a larger number of green behaviour than in the previous study. Twenty items were drawn from the GEB (Kaiser & Wilson, 2004). The bogus feedback, again allegedly based on the participants' answers to these items, took the form of a score depicted on a graph. The scale ranged from 0 to 100, with the official environmental recommendations set at 50. Depending on the experimental condition, participants received a score of either 20 (very negative), 35 (negative), 65 (positive) or 80 points (very positive).

6.1.3. Dependent measure

The same event as in previous studies was used and participants indicated to what extent they were willing to participate in the "Zero Power Day" event (α = 0.89, M = 4.22, SD = 1.70).

6.2. Results

6.2.1. Global ANCOVA

We first computed a 3 (numerical support: minority vs. "about half" vs. majority) × 4 (past behaviour: feedback score of 20 vs. 35 vs. 65 vs. 80) × continuous (green self-identity, standardised) full-factorial ANCOVA (corrected model: $F(23, 349) = 3.38$, $p < .001$, $\eta_p^2 = .182$). Self-identity yielded a strong main effect, $F(1, 349) = 56.1$, $p < .001$, $\eta_p^2 = .139$, positively predicting the intention to participate in the green event (H1). The expected 3-way interaction was also significant, $F(6, 349) = 2.19$, $p = .043$, $\eta_p^2 = .036$ (see Fig. 5); no other effects reached significance, $F_s < 0.42$, $p_s > .74$.

We then tested our specific hypotheses. We expected the effect of past behaviour to be *gradual* in the minority condition, but *dichotomous* in the majority condition. Accordingly, we created contrasts testing these different effects: a gradual and a dichotomous contrast. For each contrast of interest, the two orthogonal contrasts were also computed (Table 2; also see Judd, McClelland, & Ryan, 2009). Two separate analyses were hence conducted, the first utilising the dichotomous contrasts set, and the second the gradual one.

Let us first note that in the intermediate condition (i.e., "about half the population"), neither the gradual nor the dichotomous contrast

Table 2
Contrast codes used in Study 4 for testing the gradual versus dichotomous effects of past behaviour.

	Past behaviour			
	Score of 20 (very negative)	Score of 35 (negative)	Score of 65 (positive)	Score of 80 (very positive)
Testing the dichotomous hypothesis				
C1	1	1	−1	−1
C2	0	0	−1	1
C3	1	−1	0	0
Testing the gradual hypothesis				
C1	−3	−1	1	3
C2	1	−1	−1	1
C3	−1	3	−3	1

Note. In each case, C1 represents the contrast of interest, and C2 and C3 the orthogonal contrasts.

interacted with self-identity, $t_s < 1.58$, $p_s > .12$. Across conditions of past behaviour, self-identity had an overall positive effect on intentions, $\beta = 0.37$, $b = 0.63$, 95% CI [0.34, 0.93], $t(368) = 4.20$, $p < .001$.

6.2.2. Testing the dichotomous effect hypothesis

We reran the ANCOVA analysis while replacing the past behaviour variable with its dichotomous-coded contrast, including the two orthogonal contrasts, and considering all interactions. As expected, the self-identity × numerical support × dichotomous-coded past behaviour interaction term was significant, $F(2, 349) = 5.92$, $p = .003$, $\eta_p^2 = .033$, while the other 3-way interactions implying the orthogonal contrasts were not, $F_s < 0.54$, $p_s > .58$. Decompositions revealed that the self-identity × dichotomous past behaviour interaction was significant in the majority condition, $\beta = -0.21$, $b = -0.37$, 95% CI [-0.62, −0.12], $t(358) = -2.89$, $p = .004$ (H2). Consistent with our second hypothesis and previous findings, slopes were positive and significant in the two past negative behaviour conditions, respectively: score of 20: $\beta = 0.55$, $b = 0.94$, 95% CI [0.16, 1.71], $t(365) = 2.37$, $p = .018$; score of 35: $\beta = 0.47$, $b = 0.81$, 95% CI [0.23, 1.38], $t(365) = 2.77$, $p = .006$. In the two past positive behaviour conditions, the slopes became non-significant, score of 65: $\beta = 0.21$, $b = 0.36$, 95% CI [-0.30, 1.03], $t(365) = 1.07$, $p = .29$; score of 80: $\beta = 0.26$, $b = 0.44$, 95% CI [-0.22, 1.10], $t(365) = 1.32$, $p = .19$ (H2). In contrast, the self-identity × dichotomous past behaviour interaction did not reach significance in the minority condition, $\beta = 0.14$, $b = 0.24$, 95% CI [-0.10, 0.57], $t(358) = 1.37$, $p = .17$.

6.2.3. Testing the gradual effect hypothesis

The ANCOVA was rerun using the gradually-coded past behaviour contrast and its two orthogonal contrasts, and considering all interactions.[4] As expected, the self-identity × numerical support × gradually-coded past behaviour interaction was significant, $F(2, 349) = 6.22$, $p = .002$, $\eta_p^2 = .034$, while the other 3-way interactions implying the orthogonal contrasts were not, $F_s < 0.20$, $p_s > .82$. Decompositions revealed that the self-identity × gradual past behaviour interaction was significant in the minority condition, $\beta = 0.24$, $b = 0.19$, 95% CI [0.07, 0.31], $t(358) = 3.22$, $p = .001$ (H3). Identity slopes gradually increased with the past behaviour score, respectively: score of 20: $\beta = 0.03$, $b = 0.06$, 95% CI [-0.43, 0.54], $t(365) = 0.23$, $p = .82$; score of 35: $\beta = 0.30$, $b = 0.52$, 95% CI [0.02, 1.01], $t(365) = 2.05$, $p = .04$; score of 65: $\beta = 0.48$, $b = 0.82$, 95% CI [0.36, 1.27], $t(365) = 3.52$, $p < .001$; score of 80: $\beta = 0.72$, $b = 1.22$, 95% CI [0.66, 1.78], $t(365) = 4.28$, $p < .001$ (H3b). In contrast, the self-identity × gradual past behaviour was not significant in the majority condition, $\beta = -0.12$, $b = -0.10$, 95% CI [-0.26, 0.06], $t(365) = -1.19$, $p = .24$.

Finally, we compared how majority versus minority support impacted the self-identity slope at each level of feedback. In the very negative feedback condition (score of 20), the slope was significantly greater in the majority than the minority condition, z-score = 1.73, $p = .042$. In the moderately negative (score of 35) and the moderately positive (score of 65) feedback conditions, the slopes did not differ from one another, z-score = 0.76, $p = .22$, and z-score = 1.12, $p = .13$, respectively. In the very positive feedback condition (score of 80), however, the slope was significantly greater in the minority than the majority condition, z-score = 1.75, $p = .040$.

6.3. Discussion

In line with our second hypothesis, our fourth study consistently showed an interaction effect between self-identity, numerical support, and past green behaviour, according to which the predictive power of self-identity was lost under specific conditions of high level of past green behaviour, and majority support (i.e., under conditions eliciting a feeling of self-completeness; H2). Conversely, higher levels of past green behaviour reinforced the link between self-identity and intention when support was coming from a minority (H3). In addition to replicating our previous findings, Study 4 goes one step further by showing that past behaviour is perceived in a dichotomous manner (i.e., it is either sufficient to fulfil the identity-related goal or not) when support comes from a majority, but in a gradual manner when support comes from a minority. These findings hence indirectly strengthen the notion that minority (majority) support orients individuals towards the realisation of minimal (maximal) goals (Falomir-Pichastor et al., 2008).

7. General discussion

7.1. Hypothesised and observed results

In the present paper, we relied on self-completion theory (Gollwitzer et al., 1982, 2013; Marquardt et al., 2016; Wicklund & Gollwitzer, 1982) as a framework to delineate the boundary conditions of the impact of green self-identity on intention to reduce energy consumption, both at a personal and collective action level. We argued that self-identity would only predict intention as long as the self-definition is perceived as incomplete. We drew from social influence and self-licensing literature to predict when the self-definition would more likely be considered as complete or incomplete. Results from four experimental studies supported our hypotheses: green self-identity had an overall positive effect on intention (H1) but this effect disappeared under specific conditions, namely, when the person has adopted adequate green behaviours in the past and their environmental values were perceived as supported by an ingroup majority (H2). It is worth noting that, consistent with past research on the identity-behaviour link, the main effect of self-identity remained strongly predictive of behavioural intentions, and even more strongly than the interaction. This reinforces the idea that identity is an important predictor of this kind of processes – and many others.

Evidence for the moderating effect of minority support was mixed. We had expected that a minority, having an energising effect on its members and increasing their motivation to pursue the goal in light of past positive behaviour, would reinforce the positive link between self-identity and intentions at high (vs. low) levels of past behaviour (H3). The first two studies did not find any significant effect of the level of past green behaviour in the minority support conditions. Instead, they revealed a positive link between self-identity and intentions that was of similar strength regardless of past behaviour. In contrast, the last two

[4] We chose to rely on a linear contrast because linearity is assumed by default in most research using linear regression analyses. One might notice, however, that the spacing between the feedbacks given to the participants (i.e., 20, 35, 65, and 80) does not reflect such linearity. Therefore, one might consider that an adapted set of contrasts (i.e., −2, −1, +1, +2; and its orthogonal contrasts) would be more suitable. It is worth noting that this set of contrasts yielded the exact same results.

studies found such the expected strengthening effect. Given the mixed evidence, it might be too early to draw any definitive conclusion. However, it seems from these last results that a minority support can indeed influence the reaction to past behaviour, but that explicit and rather extreme (low and high) levels of past behaviour are needed in order for the difference to appear. Hence, minority support can reinforce the link between self-identity and intentions in the aftermath of very positive past behaviour; unexpectedly, it also seems to demotivate people, and weaken the self-identity/intentions link, in the aftermath of very negative past behaviour. In sum, in contrast to majority support for which the pattern of results was quite clear, the effect of minority support is still somewhat uncertain. Future research is needed that investigates the question further.

Across our studies, effects were replicated while manipulating (Studies 1 & 2) and measuring (Studies 3 & 4) numerical support for environmental values, and by assessing past behaviours through a self-report measure (Study 1), by using subtle manipulations of impression (Study 2), or by giving explicit feedback, either verbal (Study 3) or illustrated (Study 4). Moreover, across studies we relied on two different populations (university students and laypeople) in two national settings (Europe and the USA). Contrary to Europe where the pro-environmental norm is dominant (e.g., European Commission, 2014), adherence to environmentalism has recently been declining in the US (Jones, 2016). Accordingly, it may not be surprising that a lesser proportion of US participants believed the pro-environmental support to be a majority (Study 4) as compared to European participants (Study 3). The fundamental point is, however, that the dynamics observed were analogous in these different samples. Moreover, a significant portion of each population believed our suggestion that support would come from either a majority or a minority, which justifies studying this factor in different cultural contexts.

7.2. Theoretical implications

Previous findings had shown that self-identity has a stronger effect at low rather than high levels of past behaviour (e.g., Smith et al., 2007). The present studies support and extend these findings by showing that this depends on a contextual factor, namely numerical support for the behaviour in question. We suggest that numerical support and past behaviour should be taken into account conjointly to best predict when self-identity will and will not impact intention and action. In sum, self-completion theory lends itself as a relevant framework to account for the effects of self-identity in general, and the conditions under which these effects are more or less likely to occur.

Although not its primary goal, the present research has implications for the self-licensing literature. Indeed, in a recent set of studies, Lalot, Falomir-Pichastor, et al. (2018) showed that numerical support for environmental values moderated the effect of past behaviour – past green behaviour led to weaker intentions than past “non-green” behaviour under majority support (i.e., self-licensing) and to stronger intentions to act than past non-green behaviour under minority support (i.e., consistency). The present studies indirectly strengthen these findings and suggests that self-licensing dynamics would occur (in a majority support context) especially amongst people who strongly self-identify as environmentalists. Although counterintuitive, this fits with self-completion theory and research in which effects are postulated and observed only for individuals highly committed to the goal at stake (Gollwitzer et al., 1982; Longoni et al., 2014; Marquardt et al., 2016). It suggests that moral credentials could only be acquired (and later on used) if perceived as relevant and important by the individual. This idea is supported, for example, by a recent study that compared Republicans and Democrats, on the premise that Democrats would have a stronger green self-identity than Republicans (Truelove, Yeung, Carrico, Gillis, & Raimi, 2016). As it turned out, only Democrats expressed lesser support for a pro-environmental action after having been given the opportunity to recycle waste (i.e., they self-licensed). Future research is needed that investigates further the dynamics at the intersection between self-licensing and self-identity.

The present research also informs literature on minimal and maximal standards. Kessler and colleagues (Berthold et al., 2012; Fritsche et al., 2009; Kessler et al., 2010) argued that maximal standards are perceived gradually whereas minimal standards are perceived in an absolute fashion. In Study 4, we argued that majority versus minority support should orient individuals towards a minimal (i.e., obligation) versus maximal standard (i.e., ideal), respectively, which in turn should result in an absolute versus gradual perception of one's position. Our results support this view and thus confirm the idea that minimal and maximal standards are perceived differently.

7.3. Limitations and future directions

A few limitations of the present research need to be highlighted. First, we assessed behavioural intentions but did not consider actual behaviour. Past research showed that self-identity can influence both intentions (e.g., Smith et al., 2007; Terry et al., 1999) and behaviours (e.g., Carfora et al., 2017; Van der Werff, Steg, & Keizer, 2013), but not necessarily in the same way. The effect on behaviour can indeed be direct (and independent from intentions), but also indirect and mediated by intentions (Granberg & Holmberg, 1990). Hence, future research should assess to what extent and through which channel actual pro-environmental behaviour is impacted. Systematic analysis of the self-identity factor could then help understanding the intention-behaviour gap often observed (Sheeran & Webb, 2016).

Second, it should be noted that consistency could be studied through the mere repetition of a given behaviour, or through positive spillover effects (i.e., across behaviours). In the present research, we focused only on a general understanding of past behaviour and of future intentions, that is, on the spillover aspect. In order to gain a global understanding of the psychological processes at stake, it would be necessary to consider both aspects. Future research might want to verify that the effect of numerical support and self-identity holds when applied to the repetition of a given behaviour. Nonetheless, within a self-identity theoretical framework, focusing on spillover effects might be more appropriate than behavioural repetition. Indeed, the mere repetition of a given behaviour can be explained by a basic need for consonance (Festinger, 1957) as well as by needs related to the self-image (Aronson, 1969). Contrariwise, positive spillover only make sense with respect to a superordinate goal implying the existence of a relevant self-identity. Hence, spillover might be more relevant when the goal is to investigate effects that rely on self-identity processes.

Finally, studies were conducted within a single session, the dependent measure being assessed directly after the experimental manipulations. Hence, although our studies inform us about the immediate reaction to experimental information, they do not permit us to infer what would happen in the long run. Some past findings suggest that self-identity is somewhat malleable and can change as a function of past behaviour (Bem, 1967), but other results are not that straightforward (e.g., Truelove et al., 2016; Van der Werff et al., 2013). Hence, it would be interesting to test how self-identity can evolve in the context of a self-licensing paradigm and, in turn, affect future behaviour.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

All research materials can be obtained upon request from the first author.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2019.01.002.

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