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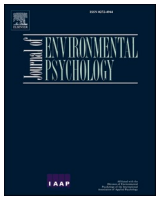

Enhancing intentions to reduce meat consumption: An experiment comparing the role of self- and social pro-environmental identities

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ABSTRACT

Research has consistently shown that a pro-environmental identity plays a critical role in motivating and sustaining pro-environmental actions. However, few studies have directly compared the effects of pro-environmental self- and social identities on pro-environmental behaviors. In the present study, we experimentally tested the effect of increasing self- and social identity salience on the intention to reduce meat consumption. A total of 678 young Italian adults were randomly assigned to one of four conditions: 1) past behavior recall plus personal feedback aimed at enhancing pro-environmental self-identity salience; 2) past behavior recall plus social feedback to reinforce pro-environmental social identity salience; 3) no feedback, where participants only recalled their past behavior; 4) control condition, i.e., recall of past behaviors unrelated to sustainability. In addition, we explored the mediating role of attitudes, subjective norms, and perceived behavioral control. The results revealed that recalling past eating-related pro-environmental behaviors enhances both the pro-environmental self-identity and the pro-environmental social identity, regardless of whether feedback was received. All experimental conditions indirectly fostered the intention to reduce meat consumption with respect to the control condition. In conclusion, recalling past pro-environmental behaviors, even without receiving specific feedback, can activate pro-environmental identities, thereby creating pathways toward stronger intentions to reduce meat consumption.

The link between dietary choices and sustainability has garnered increasing attention in today's world, which faces crucial environmental challenges. As the global population steadily increases—it is expected to reach approximately 8.5 billion by 2030 and 9.7 billion by 2050 (United Nations, 2022)—ensuring the provision of healthy food for such a massive populace will become a significant concern for governments worldwide. In this scenario, the role of food production in global environmental change will be crucial since it accounts for approximately 30% of global greenhouse gas emissions, the consumption of about 70% of the water intended for human consumption, and the utilization of over one-third of all potentially arable land (Serra-Majem et al., 2020). This profound impact of our dietary choices extends to natural systems, exacerbating the climate crisis, biodiversity loss, soil degradation, and water scarcity. Consequently, our diets affect not only individual health but also the wellbeing of our planet (Mertens et al., 2019).

Sustainable nutrition refers to a specific diet that adheres to nutritional recommendations with the minimal deterioration and consumption of natural resources (Gussow & Clancy, 1986). For a diet to be considered sustainable, ideally it would promote environmental conservation, preserve and respect biodiversity, and be culturally acceptable, economically equitable, accessible, nutritionally adequate, safe, and healthy (Burlingame & Dernini, 2010). From this perspective, reducing meat consumption is a pivotal way to make diets more sustainable. Indeed, not only has meat consumption been associated with several health issues, but it has also been shown that meat production has larger environmental and climate footprints than that of plant-based foods (Parlasca & Qaim, 2022). Therefore, reducing meat consumption helps combat climate change, conserve resources, and protect biodiversity, all while reducing the risk of developing chronic diseases, resulting in improved public health.

Adopting pro-environmental behaviors (PEBs), such as reducing meat consumption, can be complex and challenging for many individuals, mainly because they need to simultaneously balance their self-interest and altruistic motives (Caso et al., 2024; Çoker & van der

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Linden, 2022). Additionally, various factors within the social context, such as the symbolic meaning of meat in Western society, elements of the food distribution system, and individual food preferences, can pose significant obstacles to changing one's dietary behaviors (Cavazza et al., 2015; Cheah et al., 2020; Chiles & Fitzgerald, 2018). Therefore, identifying the psychosocial factors that can shape pro-environmental intentions and PEBs (including eating-related ones) is imperative to mitigate the negative consequences associated with environmental and climate crises.

Drawing upon the key assumptions of Identity Theory (Stryker, 1968), Social Identity Theory (Tajfel, 1974), the Social Identity Model of Pro-environmental Action (SIMPEA; Fritsche et al., 2018), and Self-Perception Theory (Bem, 1972), we focused on the concept of identity and its relevance to sustainable dietary choices. Specifically, as discussed below, the literature has consistently shown that pro-environmental self- and social identities can play a pivotal role in the decision to adopt PEBs. However, most studies have employed correlational research designs, which hindered the examination of potential cause-and-effect relationships between identity salience and adherence to sustainable diets. We aimed to bridge this gap in the literature by empirically testing the effect of the salience of both self- and social identities on the intention to reduce meat consumption among young adults. We chose to focus on this target group because young individuals are often more exposed to information about environmental concerns like the climate emergency and sustainable consumption (Pabian & Pabian, 2023). Consequently, they may be especially aware of these issues and likely to take steps to address them by, for example, reducing their meat consumption.

1. Self-identity, social identity, and pro-environmental behaviors

Self-identity has been conceptually defined as a set of distinctive and enduring characteristics that shape an individual's self-concept and self-assessment (e.g., "I think of myself as a sustainable consumer; " Rise et al., 2010). In line with Identity Theory (Stryker, 1968), an individual's self-structure includes various role identities that influence how they describe themselves in response to the question, "Who am I?". When a particular role identity is salient or enforced experimentally—for instance, by reminding people that they have already implemented behaviors coherent with that identity in the past (e.g., van der Werff et al., 2014)—they are generally more inclined to express the strong intention to maintain consistency with these identity standards. Indeed, when an identity categorization is active, people are strongly motivated to behave in accordance with their self-identity to avoid cognitive dissonance arising from a discrepancy between their self-perception as "a certain type of person" (e.g., a sustainable consumer) and their actual behaviors (e.g., making sustainable consumption choices).

In the field of sustainability research, extensive attention has been paid to investigating the relationship between pro-environmental self-identity and PEBs adoption. Specifically, the pro-environmental self-identity has been conceptualized as the degree to which individuals perceive themselves as committed to environmentally friendly behaviors, reflecting a strong personal concern for environmental issues (Whitmarsh & O'Neill, 2010). Behavior-specific forms of the pro-environmental self-identity have been linked to several eco-friendly practices or the intention to adopt them. For instance, the "recycler" self-identity has been shown to predict recycling behavior (Trudel et al., 2016), the "energy-saving" self-identity is significantly correlated with energy-efficient behaviors (Zeiske et al., 2021), and the "active food waste reducer" self-identity has been found to predict the intention to reduce the amount of fruit and vegetables thrown away by a household (Graham-Rowe et al., 2015).

Furthermore, broader forms of the pro-environmental self-identity have been associated with multiple and specific PEBs, including waste reduction, eco-shopping, water and domestic energy conservation, and the consumption of environmentally friendly food such as local and seasonal food (Pasquariello et al., 2024; Whitmarsh & O'Neill, 2010). From this perspective, developing a more general pro-environmental self-identity may be an effective strategy to promote PEBs, as such an identity is likely to be associated with a range of pro-environmental intentions and behaviors via the positive spillover effect (van der Werff et al., 2014). Based on these findings, in the present study, we operationalized the pro-environmental self-identity as the extent to which individuals perceive themselves—in a broad sense—as sustainable consumers. This also aligned with our study objective, which was to investigate the factors promoting the intention to reduce meat consumption as a sustainable consumption choice rather than as a merely healthy practice. This can be better captured by those meat-related eating identities that are focused on the nutritional and health benefits of reducing meat consumption (e.g., Carfora, Caso, & Conner, 2017). To our knowledge, while extensive effort has been put into understanding how the self-identity of a "person who eats healthily" influences the reduction of meat consumption, the role of the self-identity of a "person who cares about the environment and sustainability" in making this choice is underexplored.

It is essential to acknowledge that identity is a multifaceted and evolving concept shaped within a broader social context through interactions and negotiations with others (Carbaugh, 1996). As postulated in Social Identity Theory (Tajfel, 1974), social identity is an important part of an individual's self-concept since individuals categorize themselves into various social groups, and the stronger their identification with a particular group (e.g., the social group of environmentally conscious young people), the more motivated they become to adhere to group norms and values (e.g., adopting PEBs) to establish and maintain a positive self-image. In line with this theoretical framework, in the field of environmental research, it has been posited that a pro-environmental identity, in its broadest sense, emerges through the "interaction and socially constructed understandings of oneself and others" (Clayton, 2003, p. 46). Supporting the relevance of the social aspects of identity, Fritsche et al. (2018) developed the SIMPEA, suggesting that social identity processes like ingroup identification, norms, goals, and collective efficacy affect both pro-environmental appraisal and action. Accordingly, a series of mostly correlational studies have confirmed that identification with environmentally friendly groups or green consumers is associated with PEBs (e.g., Dono et al., 2010; Fielding et al., 2008). Among these contributions, Prati et al. (2017) identified a positive relationship between the social identity of an environmentalist, environmental attitudes, and PEBs (e.g., reducing hot water consumption) among a sample of Italian students. Relatedly, Zinn et al. (2023), using an experimental design, found that the salience of a pro-environmental social identity (operationalized as the degree to which an individual identifies with the group of people who care about environmental sustainability) significantly increases participants' inclination to choose a meat-free meal during a food selection task compared with conditions in which a more general, not pro-environmental self-identity or meat-eater identity is salient.

2. Making identity salient: the role of past pro-environmental behaviors

Given the close relationship between self- and social identities and PEBs, previous studies have explored strategies to manipulate the salience of these identities to promote PEBs adoption. Here, it is crucial to examine the relationship between past behavior and self-identity.

In attempting to explain how behaviors can influence attitudes, Bem (1972) proposed Self- Perception Theory, which posits that when our attitudes are weak or uncertain, we establish them by observing our behavior. For instance, if an individual is unsure about whether they are a sustainable consumer, examining their consumption choices can help them draw conclusions about their attitude: Seeing or remembering

their past sustainable consumption behaviors can strengthen the belief that they are a sustainable consumer. In this way, our behaviors are somewhat self-revealing, creating a cycle wherein behavior influences self-perception, and self-perception prompts behaviors that accord with expectations to maintain consistency.

On this basis, van der Werff et al. (2014) proposed that reminding individuals of their past PEBs can strengthen their general pro-environmental self-identity and consequently impact their future environmental actions. For instance, prompting individuals to recall their past environmental actions (e.g., avoiding food waste, preferring seasonal fruit and vegetables, reading food labels before purchasing items) can make their pro-environmental self-identity salient, and this can, in turn, increase their intention to adopt various PEBs (e.g., reducing meat consumption). These scholars have confirmed this pathway in a series of experimental studies. In the first reported experiment (Study 2), pro-environmental self-identity salience was prompted using the "hidden self procedure," which involved reminding individuals of their past actions by asking them to rate the frequency with which they performed those actions and providing feedback consistent with their past behavior, stressing that they are a "certain type of person" (Spanos et al., 1984). By adopting this procedure, van der Werff et al. (2014) observed that asking participants to express their agreement with items phrased in a way that most people can easily agree with (e.g., "I *sometimes* buy environmentally friendly products"), and then providing participants with feedback that they are "environmentally friendly people," strongly influenced their pro-environmental self-identity. In a subsequent experiment (Study 3), the authors showed that merely asking participants about the frequency with which they performed common PEBs (without providing feedback) was also effective. Specifically, participants indicating the frequency of adoption of common PEBs reported a stronger pro-environmental self-identity (compared to those evaluating the frequency of uncommon behaviors), and this was associated with making the (simulated) choice to buy an eco-friendly product over a non-eco-friendly product.

In summary, the existing literature has strongly suggested that reminding individuals of their past behavior can significantly influence their self-identity, subsequently impacting their behavioral intentions. However, given the strong link between self- and social identities (Ellemers et al., 2002), it is plausible to speculate that recalling past pro-environmental behaviors may not only reinforce self-identity as an environmentally conscious individual but also make salient the social identity associated with belonging to a group that shares similar values and behaviors. This is because individuals often interpret their actions in relation to group norms and values, especially when those actions align with the group's ideals (Fritsche et al., 2018). Thus, the act of recalling past pro-environmental behaviors can serve as a cue for individuals to categorize themselves as part of a larger group of environmentally conscious people. Based on this, from an exploratory point of view, in the present study, we also aimed to test whether this procedure can be adapted to manipulate the salience of individuals' social identity and, consequently, influence their PEB intention. More specifically, we expect that individuals, upon reflecting on their past behaviors and receiving feedback that highlights the alignment of their behavior with the norms of an environmentally conscious group, will perceive their own actions as consistent with group expectations, thereby increasing the salience of their social identity.

3. Identities and the Theory of Planned Behavior

Both forms of identity, self-identity and social identity, have frequently been integrated as additional variables into the Theory of Planned Behavior (TPB; Ajzen, 1991). This theoretical framework posits that behavior results from behavioral intentions, which, in turn, are shaped by attitudes (i.e., positive or negative evaluations of the considered behavior), subjective norms (i.e., perceived social pressure from significant others about whether to carry out the behavior), and perceived behavioral control (PBC; i.e., the perception of the ease or difficulty of performing the behavior). Studies within this framework have consistently documented that both self- (e.g., Ateş, 2020; Capasso et al., 2023; Carfora, Caso, Sparks, & Conner, 2017) and social identities (e.g., Chatzisarantis, Hagger, Wang, & Thøgersen-Ntoumani, 2009; Johnston & White, 2003) positively predict health and environmental intentions and behaviors. These extensions of the TPB typically place identity constructs at the same level as other predictors of behavioral intention. Interestingly, however, research in and beyond the field of sustainability has also suggested a relationship between identity and other TPB constructs. For example, some studies have found that self-identity can be related to attitude and PBC, whereas social identity can be associated with subjective norms (e.g., Derikx & van Lierop, 2021; Jiang et al., 2016; Michaelidou & Hassan, 2008; Thorbjørnsen et al., 2007). This pattern of relationships can be explained by considering the underlying motivations associated with each type of identity. Self-identity is notoriously driven by the desire for self-consistency: when individuals strongly identify with a pro-environmental self, they are motivated to act in ways that align with this self-concept to avoid cognitive dissonance and maintain a positive self-image. This may imply that individuals with a strong pro-environmental self-identity are more likely to view reducing meat consumption favorably and believe in their capacity to adopt this behavior. In contrast, social identity, driven by the need for belonging and social acceptance, may be more likely associated with subjective norms, as individuals are motivated to conform to the perceived expectations of their reference group. However, in these studies, the direction of the tested relationships has been mixed: Most have argued that self- and social identities affect classic TPB factors, whereas others have claimed the opposite, at least for some constructs. In the present study, we anticipated that the salience of the self- and social identity of a pro-environmental consumer—as a more general concept—would foster attitudes, subjective norms, and PBC concerning the more specific behavior of meat consumption reduction, which, in turn, would increase the intention to reduce meat consumption. Specifically, we expected that both personal and social feedback about past PEBs, as well as only recalling the same behaviors without receiving any feedback, would enhance individuals' self- and social identities, which, in turn, would increase their intention to reduce their meat consumption through attitudes, norms, and PBC.

4. The present study

Based on the above theoretical frameworks and studies (Nguyen & Platow, 2021; Prati, Albanesi, & Pietrantoni, 2017; Zinn et al., 2023), we expected that stimulating the memory of past PEBs can make pro-environmental self- and social identities salient and thus promote a reduction in meat consumption. However, a direct comparison between the relative impact of pro-environmental self- and social identities on pro-environmental intentions and PEBs is still lacking. This would inform intervention strategies aimed at fostering individual mitigation attempts. In fairness, a recent meta-analysis (Vesely et al., 2021) made this comparison, concluding that these associations are roughly similar in magnitude (large effect size). Nonetheless, to the best of our knowledge, such a comparison has not yet been made within one study or between experimentally manipulated identities. In addition, although providing feedback has been found to be unnecessary in increasing the salience of a pro-environmental self-identity (van der Werff et al., 2014), we intended to test whether providing feedback also increases the salience of a pro-environmental social identity and directly compare the effectiveness of just recalling past behavior with past behavior recall and feedback aimed at enhancing the salience of both self- and social identities. Therefore, in the present study, we aimed to expand upon the procedure that van der Werff et al. (2014) employed to examine the impact on self- and social identities and the subsequent intention to reduce meat consumption within our target group of young adults.

Specifically, we aimed to test the effect of increasing self- and social

identity salience—by recalling past PEBs—on the intention to reduce meat consumption among Italian young adults, through the TPB components (i.e., attitude, subjective norms, and PBC). Based on the above literature, we expected that participants who were prompted to recall their past PEBs (with or without receiving feedback to reinforce their self- or social identities) would report a greater intention to reduce their meat consumption than those asked to report the frequency of behaviors unrelated to environmental sustainability (H1). We also predicted that the effects of these manipulations on intention would be mediated by self- and social identity salience, which, in turn, would enhance TPB constructs (H2).

In addition, our investigation focused on the following research questions: Does feedback provision increase the positive effect of recalling past behavior (van der Werff et al., 2014), or is the latter equally effective alone (RQ1)?

The above-cited meta-analysis (Vesely et al., 2021) suggested that the relative impact of pro-environmental self- and social identities on PEBs is similar, with a slightly larger effect for self-identity. However, since collective action is particularly appropriate for addressing global environmental problems (Masson & Fritsche, 2021), we expected that feedback that enhances one's social identity would be more effective than feedback that enhances one's self-identity. To the best of our knowledge, the hidden self procedure has not been previously applied to increase social identity salience, so we did not formulate specific hypotheses about which type of identity manipulation would be more effective in increasing intention. We did, however, approach this issue as an open research question: Does feedback focused on the self-identity have a similar effect to feedback focused on the social identity (RQ2)?

5. Method

5.1. Participants and procedure

Based on an *a priori* power analysis, 436 participants are sufficient to detect a small-to-medium effect size of $f = .20$, with $\alpha = .05$ and power = .95, in a one-way ANOVA with four groups. Therefore, we aimed to recruit at least 500 participants, assuming that some respondents would not fully complete the survey or would be excluded from the analyses. Two hundred Italian students attending courses in social psychology at the University of Naples Federico II took part in a classroom project aimed at exploring sustainable eating behaviors in young adults from a psychosocial perspective. As part of participating in this project, students were asked to have at least four young adults complete an online self-report questionnaire created through the Qualtrics platform. Inclusion criteria were that participants had to be aged between 18 and 35 years, have an omnivorous diet, and not be a psychology student. We decided to exclude university students enrolled in the Department of Psychology to avoid biases related to potential knowledge about the psychological constructs we were investigating.

As displayed in the participant flow chart (Fig. 1), from the invited participants ($n = 772$), $n = 48$ did not meet the inclusion criteria, $n = 17$ were excluded ($n = 3$ from personal feedback condition, $n = 9$ from social feedback condition, and $n = 5$ from no feedback condition) because they failed the "past behavior task" (see below), $n = 20$ failed the attention check[1], and $n = 9$ refused to sign the second consent form (after debriefing). Therefore, the final sample comprised 678 young adults (women = 58.8%; mean age = 23.1 years, $SD = 3.7$, range = 18–35 years).

Regarding our final sample characteristics, most participants were university students (74.6%), came from southern Italy (90.7%), and perceived their economic resources as adequate (70.9%). Concerning their diets, 87.2% declared that they were omnivores, while 12.8% reported being omnivores but with certain restrictions for health reasons (e.g., following a gluten- or lactose-free diet).

The study was conducted following ethical approval from the Ethical Committee of Psychological Research of the Department of Humanities of the University of Naples Federico II (number prot. 8/2023).

5.2. Study design

Following the methodology that van der Werff et al. (2014) employed, before conducting the main study, we carried out a pre-test with a sample of $n = 40$ Italian university students to select common PEBs. During the pre-test, we presented participants with a list of 19 sustainable food consumption behaviors and asked them to rate the frequency with which they engaged in each behavior on a five-point scale ranging from 1 = *never* to 5 = *always*. The results of the pre-test are presented in Table 1, with behaviors ranked from the most frequent to the least frequent. We selected the six most practiced behaviors from these results for our "past behavior task."

For the main study, all participants provided informed consent at the start of the questionnaire. Subsequently, they read the following informational passage defining sustainability: "*Before proceeding with the questionnaire, we kindly ask you to read this brief definition: 'Sustainable dietary habits are those that not only provide the necessary nutrients for our bodies but also have a low environmental impact, minimizing pollution and the exploitation of the planet. Examples of sustainable dietary behaviors include preferring locally sourced products over those imported from distant countries, avoiding consuming industrially processed packaged foods, reducing food waste, and decreasing meat and dairy consumption.*'" These instructions were provided to eliminate any confusion about the research topic and subsequent questions.

Following this, participants completed items related to their interest in sustainability and the attention check item. Subsequently, we reminded people of their past PEBs (through the frequency rating; see below) and provided them with either personal or social feedback (hidden self procedure; Spanos et al., 1984). We also included a "no feedback condition" to test whether only recalling past PEBs, without receiving any feedback, would have any effect on participants' (self- and/or social) identities and subsequent intention to reduce their meat consumption, as well as a control condition. Specifically, participants were randomly assigned to one of four conditions.

1. **Past behavior recall plus personal feedback condition.** Under this condition, participants indicated the frequency of their engagement in the six most common sustainable behaviors identified during the pre-test (past behavior task) from 1 = *never* to 5 = *always*. Subsequently, they received the following feedback aimed at reinforcing their self-identity: "*The environmental sustainability of the food products we consume is now a critical criterion for many individuals, and your responses demonstrate that environmental awareness is an important part of who you are. You are someone who genuinely cares about the environment, and even those around you see you in this light and can be influenced by your example.*"
2. **Past behavior recall plus social feedback condition.** Under this condition, participants completed the same past behavior task, but they received feedback aimed at enhancing the salience of their social identity: "*The environmental sustainability of the food products we consume is now a critical criterion for young people like you, and your responses demonstrate that environmental awareness is an important part of who you and many of your peers are. You are a generation that genuinely cares about the environment, and even older generations see you in this light and can be influenced by your example.*"

[1] We included the following attention check item: "The color test you are about to take is very simple: When asked about your favorite color, please select 'green'. The purpose is to ensure that you are paying attention to the questions." Respondents were asked, on a subsequent page of the questionnaire, to indicate which color they were asked to select, with response alternatives being blue, purple, red, yellow, and green. Participants who failed the attention check were excluded from the analyses.

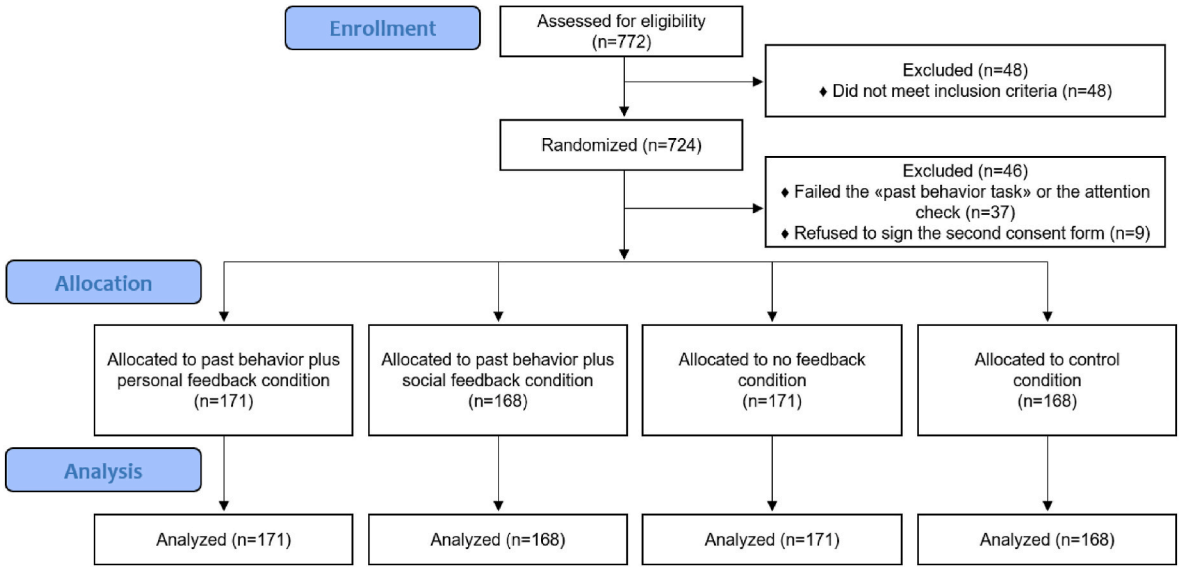

Fig. 1. Participant flow chart.

Table 1
Pre-test of common pro-environmental behaviors.

Pro-environmental behavior	*M* (*SD*)	Range
1. Consuming foods with an imminent expiry date first to avoid waste	4.38 (.84)	1–5
2. Preferring homemade dishes to ready-made and pre-packaged ones	4.35 (.66)	1–5
3. Reading the food labels and checking the expiry date to avoid waste	4.33 (1.02)	1–5
4. Cooking only the food needed, thus avoiding food waste	4.23 (.73)	1–5
5. Eating leftover food from the day(s) before	4.18 (.81)	1–5
6. Buying seasonal fruit and vegetables	4.13 (.72)	1–5
7. Avoiding foods produced using high doses of pesticides, herbicides and fertilizers	3.50 (1.20)	1–5
8. Preferring vegetable proteins (e.g., those contained in legumes, cereals and dried fruit) to animal proteins	3.30 (1.14)	1–5
9. Buying local products, favoring small producers when possible	3.23 (1.00)	1–5
10. Avoiding "exotic" products (e.g., avocado, pineapple, quinoa …) that come from distant countries, favoring local ones	3.20 (1.14)	1–5
11. Promoting fast cooking, reducing energy consumption and gaining nutrients	3.13 (.94)	1–5
12. Purchasing food from organic farming and livestock farming	3.00 (.96)	1–5
13. Avoiding purchasing food products with excessive packaging	2.98 (1.00)	1–5
14. Preferring tap water to bottled water	2.88 (1.64)	1–5
15. Reading the label to check whether the product is organic	2.85 (1.03)	1–5
16. Choosing meat from ecological farms and from producers you know directly	2.85 (1.25)	1–5
17. Limiting the purchase of products with plastic packaging	2.73 (.96)	1–5
18. Avoiding the consumption of meat and derivatives	2.68 (1.31)	1–5
19. Reading the label to check whether the product is local	2.38 (.87)	1–5

3. **No feedback condition.** Under this condition, participants completed the past behavior task concerning sustainable behaviors without receiving any feedback.
4. **Control condition.** Under this condition, participants indicated the frequency of their engagement in six behaviors unrelated to sustainability from 1 = *never* to 5 = *always*. An example item here was, "Going to the cinema."

Following van der Werff et al. (2014), participants under the three experimental conditions who reported a mean score for past behavior lower than the midpoint of the scale (i.e., "failed" the past behavior task) were excluded from the analyses. This is because the feedback would not have been credible for those participants, so the manipulation could have failed.

After manipulation, all participants completed the self- and social identity measures, TPB measures (intention to reduce meat consumption, attitude toward reducing meat consumption, subjective norms, and PBC), and sociodemographic information questions. At the end of the questionnaire, all participants received comprehensive information about the research design. Specifically, we explained that the study aimed to evaluate how self- and social identities influence the intention to consume sustainable food products, using an experimental research design. Participants were briefed on the specificity of the four conditions, and it was emphasized that the feedback provided under the first two conditions was fictitious and identical for all participants in those groups. Following the debriefing, participants were requested to provide informed consent once more, in compliance with the ethical guidelines of the Italian Association of Psychology (2015) for the use of deception in psychological research. The experimental material and dataset are available at https://osf.io/qbhg9/?view_only=20e10a1c4fed42f4902737aa87a296d8.

5.3. Measures

5.3.1. Mediators and the dependent variable

Pro-environmental self-identity was measured with three items ("Being a sustainable consumer is an important aspect of my way of being," "I am the type of person who cares about the environment and sustainability," and "I think of myself as a sustainable consumer; " adapted from van der Werff et al., 2014) on a five-point Likert scale ranging from 1 = *completely disagree* to 5 = *completely agree*. Cronbach's α = .77.

Pro-environmental social identity was measured with three items ("Being part of the sustainable consumer group is an important aspect of my way of being," "I feel similar to other sustainable consumers," and "I feel a strong connection with other sustainable consumers; " adapted from Guidetti et al., 2023) on a five-point Likert scale ranging from 1 = *completely disagree* to 5 = *completely agree*. Cronbach's α = .82.

Attitude toward reducing meat consumption was assessed with 10 items on a semantic differential scale ranging from 1 to 5 (i.e., "Reducing meat consumption in the next two weeks would be … *harmful/beneficial*, *useless/useful*, *dangerous/safe*, *irresponsible/responsible*, *stupid/intelligent*, *agreeable/disagreeable*, *undesirable/desirable*, *unpleasant/pleasant*, *disgusting/tasty*"). Cronbach's α = .92.

Subjective norms were assessed with three items (e.g., "Most people important to me think I should reduce my meat consumption in the next two weeks") using a five-point Likert scale ranging from 1 = *completely disagree* to 5 = *completely agree*. Cronbach's α = .89.

PBC was measured with four items. The first three items (e.g., "Reducing meat consumption in the next two weeks is entirely up to me") were rated on a five-point Likert scale ranging from 1 = *completely disagree* to 5 = *completely agree*. The fourth item (i.e., "How easy or difficult do you think it would be for you to reduce meat consumption in the next two weeks?") was assessed using a five-point scale ranging from 1 = *very difficult* to 5 = *very easy*. Cronbach's α = .81.

Intention to reduce meat consumption was measured using four items. The first three items (e.g., "I intend to reduce meat consumption in the next two weeks") were answered on a five-point Likert scale ranging from 1 = *completely disagree* to 5 = *completely agree*, whereas the last item (i.e., "How likely are you to reduce your meat consumption in the next two weeks?") was rated on a five-point scale ranging from 1 = *very unlikely* to 5 = *very likely*. Cronbach's α = .95. All items assessing TPB constructs were developed by following the guidelines outlined by Fishbein and Ajzen (2011) and adapting items previously used in the Italian context (Caso et al., 2024).

5.3.2. Sociodemographic information and additional variables

Participants provided information about their age, gender, geographical region of residence, education, socioeconomic status, diet, and a series of control variables not used in the present study (past meat consumption reduction behavior, food involvement, interest in sustainability; see also Footnote 2).

5.4. Analyses

To test our hypotheses and answer our research questions, we ran a multiple mediator model through PROCESS, the SPSS macro provided by Hayes (2018). Specifically, we tested a customized model whereby three dummy variables representing the experimental conditions (vs. the control condition) were entered as predictors; self- and social identities were entered as mediators operating in parallel; attitude, subjective norms, and PBC were entered as subsequent parallel mediators; the intention to reduce meat consumption was entered as the dependent variable (see Fig. 2).

6. Results

Descriptive statistics for and the correlations among all measures are displayed in Table 2, and the findings of a preliminary Multivariate Analysis of Variance (MANOVA) are reported in Table 3. The mediation model results are reported in Fig. 2. In contrast to H1, none of the experimental conditions had a significant total effect on the intention to reduce meat consumption, $p > .378$. However, all of them indirectly fostered participants' intentions to reduce meat consumption, though through different routes (H2). As expected, recalling PEBs strengthened participants' pro-environmental self- and social identities (see also Table 3), regardless of whether they had received any feedback. Indeed, all three experimental conditions had the same effects on self- and social identity salience, with a slightly larger effect on self-identity salience ($.19 \leq \beta \leq .20$, $p < .001$, 95% CI [.15, .44]) than on social identity salience ($.14 \leq \beta \leq .15$, $p < .002$, 95% CI [.09, .40]). In turn, self-identity was positively associated with attitudes, PBC, and the intention to reduce meat consumption, whereas social identity was positively associated with subjective norms. Finally, these TPB constructs predicted the intention to reduce meat consumption, $R^2 = .44$, $F(8, 669) = 65.77$, $p < .001$, $f^2 = .79$.

Significant indirect effects on intention were found for personal feedback, social feedback, and PEBs recall (vs. control condition) via self-identity (*IE* = .06, *SE* = .03, 95% CI [.02, .13]); via self-identity and attitude (*IE* = .05, *SE* = .02, 95% CI [.02, .10]); via self-identity and PBC (*IE* = .01, *SE* = .006, 95% CI [.004, .03]); via social identity and subjective norms (*IE* = .01, *SE* = .005, 95% CI [.002, .02]).[2] We have reported only one indirect effect for three experimental conditions because, interestingly, they had exactly the same indirect effects. Therefore, the answer to RQ1 was that just recalling past behavior is as effective alone as when paired with either self- or social identity-focused feedback. As for RQ2, although feedback focused on self- and social identities had the same impact on the salience of both identities, when examining the magnitude of indirect effects and the number of mediated processes, the self-identity emerged as more effective in fostering the intention to reduce meat consumption. This is confirmed also comparing the total and direct effects of the two identities on intentions (Fig. 2): the total effect of social identity on intentions was fully mediated by norms, whereas the stronger effect of self-identity is only partially mediated by attitudes and PBC, as maintaining a significant direct effect also after controlling for the mediators.

7. Discussion

Currently, the adoption of highly pro-environmental lifestyles is both necessary and urgent. In the present paper, we aimed to test the effect of increasing pro-environmental self- and social identity salience—by recalling past PEBs—on the intention to reduce meat consumption among Italian young adults. Furthermore, we explored whether this influence was mediated by the variables from the TPB (Ajzen, 1991).

Contrary to our first hypothesis (H1), recalling past PEBs (with or without feedback) does not have a significant total effect on the intention to reduce meat consumption. However, consistent with H2, both self- and social identities were found to be crucial mediators influencing the intention to reduce meat consumption through various pathways involving attitudes, subjective norms, and PBC. These findings hold significant insights. First, they reinforce and extend the results of van der Werff et al. (2014) by showing that simply recalling past PEBs without receiving additional feedback can effectively increase the salience of both self-identity and social identity. The observation that all conditions not only enhance both self- and social identity salience to a similar degree may seem surprising, but it can be explained by the well-established conceptual and empirical links between self- and social identities (Ellemers et al., 2002). The high correlation ($r = .76$) we found between the two constructs supports this interpretation. Given the close interconnection between these identities, reflecting on past PEBs likely triggers the simultaneous activation of both people's self-perception as sustainable consumers and their sense of belonging to the group of environmentally conscious individuals. Such a link can be especially true for young adults, who are generally more attentive to environmental issues (Pabian & Pabian, 2023). For this group, environmental consciousness is not merely a personal concern but a social imperative shaped by the awareness that their generation is especially committed to overcoming environmental challenges while being inspired by their peers' pro-environmental actions (Wallis & Loy, 2021).

Examining the mediating pathways can further elucidate the roles of self- and social identities. Consistent with previous research (e.g., Carfora, Caso, Sparks, & Conner, 2017), self-identity emerged as a key variable that directly predicts the intention to reduce meat consumption, even though we operationalized it as a broader pro-environmental

[2] Additional models including participants' gender, past meat consumption reduction behavior, food involvement, or interest in sustainability as covariates yielded roughly the same findings.

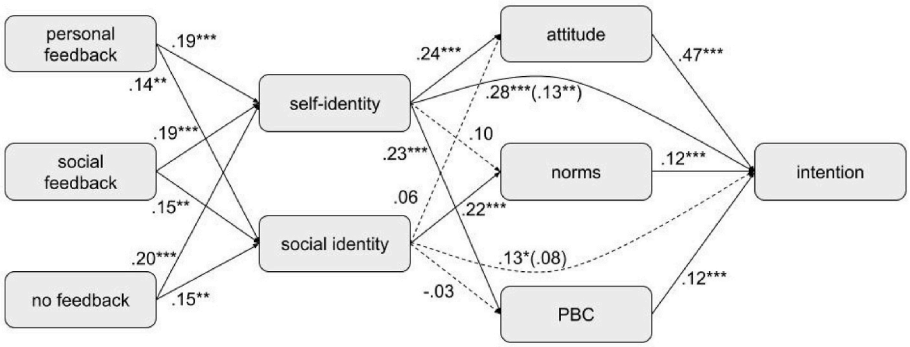

Fig. 2. The multiple mediator model displaying experimental conditions' indirect effects on meat-reduction intention.
Note. *$p < .05$, **$p < .01$, ***$p < .001$. β standardized coefficients are reported (direct effects in brackets).

Table 2
Descriptive statistics and correlations among measures.

	M	*SD*	2	3	4	5	6	7	8
1. Self-identity	3.52	.66	.76***	.28***	.27***	.20***	.34***	.59***	.38***
2. Social identity	2.94	.71		.24***	.30***	.14***	.30***	.55***	.34***
3. Attitude	3.41	.84			.27***	.31***	.47***	.29***	.60***
4. Subj. Norms	2.19	.86				.12**	.27***	.18***	.32***
5. PBC	3.13	.93					.40***	.10**	.32***
6. Past meat consumption reduction behavior	2.48	1.06						.37***	.64***
7. Interest	2.79	.75							.42***
8. Intention	2.89	1.07							

Note. **p < .01, ***p < .001.

Table 3
Means (and standard deviations) of the model variables as a function of experimental condition.

	Control	Personal feedback	Social feedback	No feedback	
Self-identity	3.29[a] (.66)	3.58[b] (.67)	3.59[b] (.66)	3.59[b] (.60)	F (3,674) = 8.86, p < .001
Social identity	2.75[a] (.71)	2.99[b] (.72)	3.00[b] (.74)	3.00[b] (.65)	F (3,674) = 5.04, p = .002
Attitude	3.34 (.91)	3.44 (.81)	3.42 (.81)	3.42 (.82)	F (3,674) = .44, p = .721
Subj. Norms	2.09 (.89)	2.23 (.89)	2.23 (.85)	2.23 (.83)	F (3,674) = 1.10, p = .349
PBC	3.11 (.98)	3.19 (.94)	3.11 (.87)	3.13 (.93)	F (3,674) = .27, p = .842
Intention	2.84 (1.11)	2.94 (1.09)	2.83 (1.02)	2.94 (1.05)	F (3,674) = 552, p = .647

Note. Means on the same row with different superscripts are significantly different.

self-identity rather than an identity specific to meat consumption. Moreover, we found the self-identity to be associated with both attitudes toward and PBC over meat consumption reduction, suggesting that when individuals perceive themselves as sustainable consumers, they develop a more favorable orientation toward and a greater sense of control over engaging in this specific PEB. These links align with the findings of previous research that have integrated self-identity into the TPB framework, reporting that self-identity can shape attitudes and PBC, as well as directly predict intentions. Regarding attitude, for instance, Derikx and van Lierop (2021) showed that a pro-environmental self-identity is a strong positive predictor of attitudes toward making environmentally friendly transport choices. Similarly, Michaelidou and Hassan (2008) found that having an "ethical self-identity" (operationalized as the extent to which an individual perceives themselves as an ethical consumer, i.e., environmentally conscious and inclined to purchase eco-friendly products) predicts both attitudes toward and the intention to purchase organic food. As for the link between self-identity and PBC, while we did not find studies directly reporting that a pro-environmental self-identity can shape PBC, we can propose a possible explanation for this link. When individuals self-identify as sustainable consumers, they are more motivated to behave consistently with their environmental values (i.e., biospheric values) to avoid cognitive dissonance (van der Werff et al., 2014). This motivation to maintain a consistent self-image can lead individuals to actively try to reduce their meat consumption, thereby increasing their perception of being in control of this behavior. This interpretation can be applied to our case when considering that reducing meat consumption, as examined in this study, is a relatively straightforward behavior compared to its complete elimination. Therefore, individuals with a stronger pro-environmental self-identity may attempt to reduce their meat consumption more frequently, as supported by the moderate correlation between past meat consumption reduction behavior and the self-identity (r = . 34), increasing their perception of being capable of doing so.

Contrastingly, the social identity only predicted subjective norms for meat consumption reduction. This finding aligns with the key principles of Social Identity Theory (Tajfel, 1974), which posit that individuals derive a sense of who they are from their group memberships and are motivated to adhere to the norms and expectations associated with those groups. It also supports the principles of SIMPEA (Fritsche et al., 2018), which highlight the roles of both ingroup identification and norms in shaping pro-environmental action. Together, our findings showed that when the salience of the pro-environmental social identity increases, individuals may perceive higher social pressure to engage in sustainable dietary practices, such as reducing their meat consumption.

Overall, the present findings confirm that recalling past PEBs, even without receiving specific feedback, can activate these identities and create pathways toward stronger intentions to reduce meat consumption. Among the identified mechanisms, the self-identity appeared to be a particularly potent mediator. This extends the existing literature by offering experimental support for the link between self-identity and

PEBs (see Udall et al., 2021, for a meta-analysis). However, the potential of leveraging social identity should not be overlooked, especially since activating this identity can heighten the motivation to adopt PEBs when encouraged by significant others, whose influence may be particularly relevant for younger generations (Wallis & Loy, 2021).

Our findings add to the existing body of research in two ways. First, in terms of our knowledge about how to promote a pro-environmental lifestyle, we confirmed that, beyond exhortative approaches, a self-influence process can be activated by cues that remind people of their past congruent behavior. Even though this is not the first time this evidence has been found, we experimentally documented that this effect is due to the pivotal role of self- and social identities in boosting the effects of attitudes, social norms, and PBC on the intention to reduce meat consumption.

Second, the present study contributes to the literature utilizing the TPB as a theoretical framework to predict behavior by showing that self- and social identities may not only explain a wider portion of intention and behavioral variance (e.g., Rise et al., 2010), but they can also promote the classical factors included in the TPB. In addition, we believe that a strength of this research was its focus on young adults, who are probably best equipped to trigger a cycle by addressing the issues and engaging older generations in ways that inspire action (e.g., Damerell et al., 2013). Nonetheless, further studies might replicate the same procedure with different samples to explore whether different results emerge concerning, for instance, the relative weight of self- and social identities.

This study has a few limitations. First, we chose to test our model on the intention to perform just one behavior. We decided to select the intention to reduce meat consumption as the outcome because it has been understudied. However, meat consumption reduction can have both individual advantages (i.e., disease prevention) and collective advantages (i.e., reduction of the environmental footprint). Future studies could test whether the observed effects are due, at least in part, to the individual advantages of this specific behavior or whether they could be reproduced in other eco-friendly behaviors that do not entail individual advantages or that are even costly (e.g., recycling).

Second, due to the social desirability of the behaviors we focused on in our study, it is difficult to ascertain whether the self-reports provided by participants correspond to their actual feelings or behaviors or if they were just reporting beliefs and goals that they believed were the "right" responses. A final limitation of the current study was its lack of behavioral outcomes.

While acknowledging the study's potential weaknesses, our findings still have several important implications. They help clarify the role of the salience of self- and social identities in supporting the intention to behave in an environmentally friendly way. This alone is interesting, but it also has potential applied importance, such as for the design of effective communications based on past behavior recall.

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CRediT authorship contribution statement

Miriam Capasso: Writing – review & editing, Writing – original draft, Validation, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Margherita Guidetti:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Formal analysis, Conceptualization. **Marcella Bianchi:** Writing – review & editing, Writing – original draft, Software, Resources, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Nicoletta Cavazza:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization. **Daniela Caso:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

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