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Proenvironmental self identity as a moderator of psychosocial predictors in the purchase of sustainable clothing

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Previous research investigated the impact of psychosocial predictors (e.g. attitude, social and moral norm, perceived behavioral control, intention) on sustainable clothing purchasing. To date, no studies considered whether proenvironmental self-identity moderates the effects of these predictors on behavior. In this study, we adopted an intrapersonal approach and a longitudinal design to assess the moderating role of proenvironmental self-identity in predicting intentions and behaviors, considering gender differences. 250 participants completed an initial questionnaire on the predictors of three sustainable clothing purchasing. A month later, they filled out a second questionnaire to self-assess these behaviors. The results showed that social and internalized norms (moral norms) were notably influential of participants' intentions. Affective attitude influenced behavior positively, while cognitive attitude had a negative influence. When considering the moderating role of proenvironmental self-identity, significant gender differences emerged. Women with a weak proenvironmental self-identity expressed a higher intention to purchase sustainable clothing when they had high affective attitudes and descriptive norm but low cognitive attitudes. Women with a strong proenvironmental self-identity intended to purchase sustainable clothing when they had high moral norms and cognitive attitudes but low descriptive norm. Man with a weak proenvironmental self-identity and high positive affective attitude increased their future SCP.

In recent decades, the fashion industry has experienced unprecedented growth in production and consumption, leading to significant environmental consequences[1]. The relentless pursuit of fast fashion has resulted in mountains of discarded clothing, excessive resource depletion, and exploitation of labour[2]. As the adverse impacts of this industry become more apparent, it is crucial to shift towards a more responsible approach to fashion. A viable solution can be the promotion of at least three behaviors related to the purchase of sustainable clothing (from now on, Sustainable Clothing Purchasing—SCP), namely eco-friendly, second-hand, and high-quality clothing purchasing. First, eco-friendly fashion encompasses a range of practices, including environmentally friendly materials and transparent supply chains that help preserve ecosystems and reduce toxic chemicals[3]. Second, by extending the life of garments on the second-hand market, we can reduce the demand for new products and thus conserve valuable resources[4]. Third, prioritizing high-quality, durable clothing reduces the frequent replacement of garments and shifts the focus away from fast fashion[5]. Despite the importance of these three types of sustainable behaviors, none of them alone can sufficiently mitigate the environmental impact of the fashion industry. Therefore, it is crucial to develop large-scale public campaigns that promote the simultaneous adoption of these sustainable consumption practices. To achieve this, it is essential to address the research question of what psychosocial factors encourage people to adopt all these behaviors, regardless of the specific motivations that might drive the adoption of one behavior over another (e.g., conforming to social expectations to buy vintage clothing). Overall, the present study aimed to answer this research question and contribute to the current literature in at least three ways. First, numerous studies have examined the psychosocial factors that influence consumers' intentions and engagement in these three behaviors[2,4,6,7], mainly referring to one of the most widely used model to predict people's purchasing behavior, that is the Theory of Planned Behaviour (TPB[8];). However,

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to the best of our knowledge, none of these studies examined the psychosocial factors that underlie eco-friendly, second-hand, and high-quality clothing purchasing at the same time. Therefore, this study aimed to develop a multi-behavior TPB model to explain consumers' SCP behaviors.

Second, this study included additional psychosocial factors to better explain SCP intentions and behaviors. Unlike previous studies, which often did not distinguish between affective and cognitive attitudes or between injunctive and descriptive norms [e.g.[9]], our research made these distinctions to provide a more detailed analysis.

Third, very few studies have considered the predictive role of proenvironmental self-identity, none have examined its moderation effect on the relationships between predictors and SCP intentions/behaviors.

By exploring this three aspects, our study aims to contribute to the development of comprehensive public campaigns that foster a broader and more synergistic approach to sustainable fashion consumption, ultimately supporting consumers in considering a wider array of sustainable choices. These choices can help them overcome the various obstacles associated with SCP adoption, such as higher costs, limited availability, and societal pressures favoring fast fashion.

The manuscript is organized as follows. The Literature Review delves into the theoretical background, focusing on the Theory of Planned Behavior (TPB) and additional psychosocial factors that might influence SCP. The Methods section describes the study's design, participant recruitment, and the measures used to assess the relevant variables. This is followed by the Results section, where we present our findings, including the analysis of predictors of SCP intentions and behaviors, with attention to gender differences. Finally, the Discussion contextualizes these results within the existing literature, highlighting theoretical and practical implications, as well as the study's limitations and directions for future research.

Literature review

Applying the theory of planned behavior to understanding intentions and behaviors related to the purchase of sustainable clothing

The TPB is a widely used model in the study of consumers' clothing purchasing behavior[8], positing that intention is the key determinant of behavior. Intention reflects an individual's motivation to perform a behavior based on efforts and planning. In the TPB, is influenced by three factors: attitude, subjective norm, and perceived behavioral control.

Attitude, which refers to a favourable or unfavourable evaluation of the behavior[8], conceptually includes cognitive (i.e., perception of the behavior's benefits) and affective (i.e., perception of the behavior's pleasantness) components[10]. Research shows a strong link between positive attitudes towards environmental protection and sustainable clothing, and the likelihood of engaging in responsible purchasing behaviors[7,11].

Most prior studies focused only on the cognitive component of consumers' attitudes, neglecting the affective counterpart. However, research shows that including affective components enhances the TPB model's ability to explain behaviors related to health and environmental protection[12,13]. Furthermore, affective attitudes excel in predicting consumer behaviors because they better capture automatic and emotional factors influencing frequent behaviors, consider the substantial role of habits, are rooted in direct experience, and align more with intrinsic motivations driven by the pleasure of the behavior itself[14]. This study aims to provide a nuanced understanding of how both cognitive and affective attitudes impact consumers' SCP intentions and behaviors.

Subjective social norm refers to the perception that important individuals or groups will approve and support a particular behavior[7]. It can be divided into injunctive and descriptive norms. Injunctive norm involves what most people approve of, while descriptive norm indicates what people commonly do[15]. In this study, injunctive norm refers to perceived approval or disapproval of sustainable clothing purchasing, and descriptive norm reflects perceptions of others' purchasing behavior. Most research on sustainable clothing purchasing has focused only on injunctive norms[10,16]. Studies considering both types of norms have shown mixed results: some found both to be strong predictors of purchasing intention[17,18], while others found only one to be significant[2,16,19]. Additionally, some research analyzed the direct impact of social norms on actual proenvironmental behavior, with findings indicating that social injunctive norm is significantly associated with sustainable clothing purchasing behavior[20,21]. To develop a comprehensive understanding of the normative influences, this study aimed to investigate their role in shaping SCP intentions and behaviors.

Perceived behavioral control refers to an individual's perception of how easy or difficult to a behavior is. It is an important factor in predicting both SCP intentions and behaviors. Previous TPB studies have shown that consumers with high perceived behavioral control are more likely to intend to purchase eco-friendly[10] and second-hand clothing[22,23]. However, some studies on the general intention to purchase sustainable clothing found no effect of perceived behavioral control[2,7]. Thus, the proposed multi-behavior model included perceived behavioral control as a predictor of both intention and behavior.

To extend the current literature as aforementioned, the first aim of the current study was to explore the influence of TPB and additional variables on intentions and behaviors related to the SCP. Based on previous literature[2,6,7,10,23,24], we expected that:

Consumers' affective attitude (*H1a*), cognitive attitude (*H2a*), injunctive norm (*H3a*), descriptive norm (*H4a*) and perceived behavioral control (*H5a*) significantly predict future SCP intentions.

Consumers' cognitive attitude (*H1b*), affective attitude (*H2b*), injunctive norm (*H3b*), descriptive norm (*H4b*), perceived behavioral control (*H5b*) significantly predict future SCP behaviors.

Considering the role of moral norm in determining intentions and behaviors related to sustainable clothing purchasing behaviors

One of the main critiques of the TPB is its neglect of moral drives[24,25]. Moral norm is related to individuals' perceptions of the moral rightness of a behavior[26]. Unlike social norm, which describes behavioral standards for

what is typical or normal[15], moral norms involve a personal responsibility for actions and their consequences, especially in the context of proenvironmental behavior. Moral norms reflect the awareness that environmental protection depends on individual actions, creating a sense of responsibility[27]. Several studies support the inclusion of moral norms in the TPB model to increase the explained variance of intentions[28–30], which has been confirmed in contexts such as purchasing eco-friendly clothing[11] and avoiding counterfeit luxury fashion products[31]. Notably, some scholars showed that moral norm was the greater predictor of female consumers' intention to purchase sustainable clothing[2]. Beyond TPB studies, other research has demonstrated that moral norms directly impact SCP. Given its importance, this study incorporates moral norms into a multi-behavior model to better explain consumers' SCP intentions and behaviors. Based on this, we expected that:

Consumers' moral norm significantly predict SCP intentions (H6a) and future SCP (H6b)

Including past behaviors as predictor of intentions and behaviors related to sustainable clothing purchasing behaviors

Research using the TPB model has highlighted the importance of past behavior, which refers to the frequency of a behavior performed in the past, in explaining sustainable intentions and behaviors[32]. In proenvironmental contexts, past behaviors have been shown to positively influence future actions and predict sustainable clothing purchases[2,33]. However, past positive behaviors can also lead to self-licensing, where individuals justify subsequent negative actions by citing their previous good deeds[34]. Examples of self-licensing include increased energy consumption after a conservation success[35], reduced recycling after sustainable grocery shopping[36], and decreased likelihood of proenvironmental actions after signing a petition[37]. To clarify the role of past behavior in predicting diverse SCP behaviors, the present study included it as an additional predictor of the TPB model. Thus, we hypothesised that:

Consumers' past SCP significantly predict intentions towards SCP (H7a) and future SCP behaviors (H7b).

Analysing the predictive role of proenvironmental self-identity

Past research on sustainable behaviors has extensively examined the role of proenvironmental self-identity, defined as the extent to which individuals perceive themselves as environmentally friendly[38]. This concept has been approached and measured in various ways, drawing on theories of self-concept, interpersonal relationships, and identity theories (for details[39]).

In this study, proenvironmental identity is conceptualized with reference to identity theory[39–46], where self-identity is the term individuals use to define themselves concerning certain behaviors[47]. Self-identity involves a composite of roles that a person fulfills, requiring ongoing actions to affirm the self-concept[38]. Accordingly, we define proenvironmental self-identity as the extent to which people perceive themselves as environmentally friendly, and consequently, are more likely to engage in proenvironmental behaviors[48].

Importantly, our concept of proenvironmental self-identity differs from the concept of environmental identity[46,49]. This concept differs from environmental identity, which involves a sense of connectedness with the natural environment, influencing one's perceptions and actions toward the world. Environmental identity means valuing the environment as an integral part of oneself, whereas proenvironmental self-identity refers to viewing oneself as someone who performs proenvironmental behaviors. Although there is a relationship between the two, they are not identical. For instance, someone may feel connected to nature but not engage in proenvironmental behaviors due to a lack of awareness or connection between environmental issues and personal actions[48].

Proenvironmental self-identity is particularly important for understanding SCP, as it directly reflects the propensity to engage in such behaviors, rather than merely valuing the environment as part of one's self-concept. This focus helps clarify the motivations behind SCP and provides insights into promoting sustainable behaviors.

Furthermore, our definition of self-identity differs from self-completion theory, which posits that individuals strongly identifying with a particular goal are more likely to engage in behaviors affirming that identity, especially when they perceive it as incomplete or challenged[50]. Self-completion theory suggests that individuals committed to an identity goal are motivated to engage in behaviors that represent progress toward that goal, thereby strengthening their self-concept[50]. Both self-identity theory and self-completion theory offer valuable insights into how individuals perceive and develop their self-concept, but they approach the process differently. Self-identity theory is content- and social-oriented, focusing on the enduring aspects of the self-concept. In contrast, self-completion theory is motivation- and goal-oriented, emphasizing behaviors driven by the desire to complete an identity goal.

Given that sustainable purchasing is often a consistent, ongoing behavior rather than a one-time action aimed at achieving a specific identity goal, this study refers to self-identity theory. This emphasis highlights the enduring aspects of the self-concept, aligning more closely with the SCP nature[39,51–54].

Important insights can be drawn from studies on proenvironmental self-identity. Particularly in the case of sustainable eating behavior[55–58], research has shown that people who identify as 'green consumers' are more likely to consume sustainable food[56,59,60]. In the case of the SCP, only three studies have examined the influence of proenvironmental self-identity on intention and behaviors. One qualitative study found that proenvironmental self-identity influenced the purchase of second-hand products, including clothing[61]. In a quantitative study, environmental identity was identified as the strongest predictor of proenvironmental fashion behaviors[62]. However, in another study no significant differences were found between high and low proenvironmental self-identity in relation to garment reuse, except for involvement in the design process and short-term use of garments[44]. In this study, we further explored the role of proenvironmental self-identity and assessed its influence on intentions and behaviors related to SCP.

Although proenvironmental self-identity may moderate all relationships between TPB predictors and intention or behavior, previous studies focused merely on how self-identity interacts with descriptive norm and past behavior.

In environmental psychology, the interaction between proenvironmental identity and descriptive norm is a growing area of interest. he theory of normative social behavior suggests that descriptive norm's influence on behavior can be moderated by how well an individual's self-identity aligns with that behavior[63–67]. For instance, individuals who strongly identify as recyclers are more likely to be influenced by descriptive norms in their recycling behaviors[68]. In addition, the identity activation theory[69] posits that individuals tend to align sustainable behaviors based on the perceived congruence with their self-identity and perceived descriptive norm[69,70].

Proenvironmental self-identity and descriptive norm can be combined in four different ways. First, when both are high, people enact highly sustainable behaviors because they are consistent with others' behaviors and are aligned with their identification. Second, when both are low, individuals are expected to report significantly low sustainable behaviors[71]. Third, when proenvironmental self-identity is low, but perceived descriptive norm is high, less salient environmental identity may become overcompensated by more salient social pressure. In this case, not acting in line with the others' behaviors is likely to produce an intra-personal conflict because behaving consistently with the norm facilitates meeting interpersonal goals[69,72]. Fourth, when proenvironmental identity is high, but the perceived descriptive norm is low, people may be driven more by environmental identity than by group identity[69]. In line with the above[69–72], we hypothesised that:

> Among consumers with higher levels of proenvironmental self-identity, the stronger descriptive norm is associated with higher intentions towards SCP (*H9a*) and more frequent future SCP (*H9b*).

> Conversely, among consumers with lower levels of proenvironmental self-identity, the weaker descriptive norm is associated with lower intentions (*H9c*) and less frequent future SCP (*H9d*).

As to the link with past behavior, identity theory[43] suggests that repeated behavior becomes an integral part of one's self-concept, predicting a positive interaction between self-identity and past behavior in determining intentions and behavior. However, evidence in this area is mixed.

Some studies found a positive interaction between proenvironmental self-identity and past behavior[73], indicating that individuals with a strong proenvironmental self-identity and a history of sustainable actions are more likely to continue these behaviors. Conversely, other studies have found a negative interaction, where self-identity influenced intentions more at low levels of past behavior[74,75]. This suggests that self-identity is more significant when the behavior is not yet habitual or routinized[76]. This negative interaction can be explained by self-completion theory[33], which posits that individuals committed to an identity goal experience tension that motivates them to work towards fulfilling this goal. Once the goal is perceived as complete, a sense of self-completeness leads to a reduction in effort[35,77,78]. Given the mixed results on the moderating influence of proenvironmental self-identity and past behavior, and since no studies have tested this in the context of SCP, we addressed this gap by formulating the following Research question (RQ).

> To what extent does proenvironmental self-identity interact with consumers' past SCP in influencing *SCP intentions (RQ1a) and future behavior (RQ1b)?*

Finally, in the present research, we explored all possible interactions between proenvironmental self-identity and TPB variables (including moral norm) in predicting either intentions or behavior.

> To what extent does proenvironmental self-identity interact with consumers' affective attitude (*RQ2a*), cognitive attitude (*RQ3a*), injunctive norm (*RQ4a*), perceived behavioral control (*RQ5a*) and moral norm (*RQ6a*) in influencing SCP intentions?
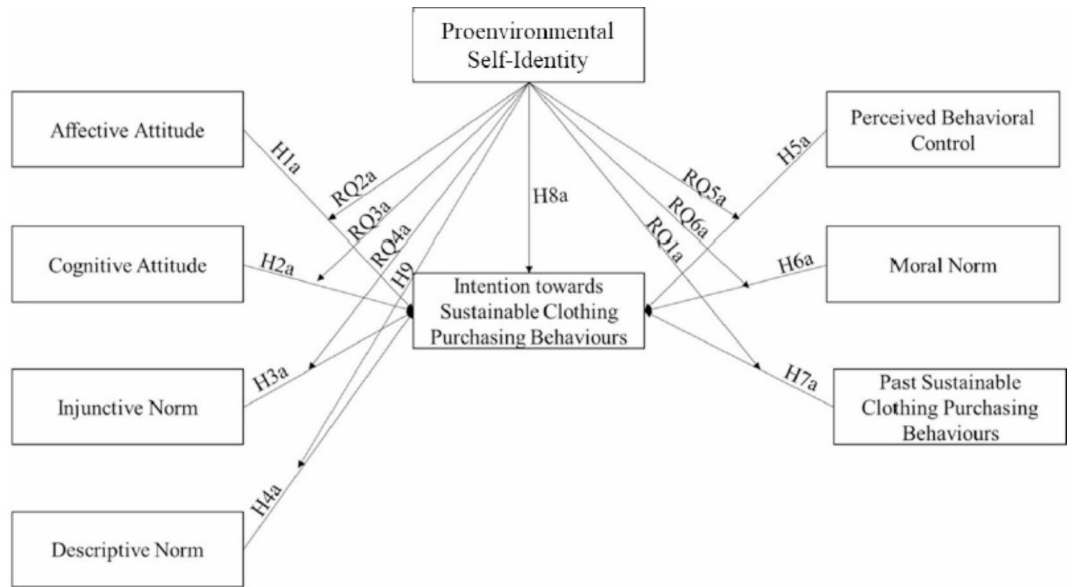
> To what extent does proenvironmental self-identity interact with consumers' affective attitude (*RQ2b*), cognitive attitude (*RQ3b*), injunctive norm (*RQ4b*), perceived behavioral control (*RQ5b*) and moral norm (*RQ6b*) in influencing future SCP behavior?

Figures 1 and 2 show the theorized models including the above hypotheses and research questions.

Gender differences in sustainable clothing purchasing behaviors

Gender differences significantly influence sustainable and ethical fashion choices. Women tend to exhibit more ethical behavior and purchasing, are more sensitive and aware to ecological issues[79], engage more in SCP[54,79–81]. These differences in SCP between genders raise questions about variations in the determinants of their purchase intentions and behaviors.

Nevertheless, as for the different paths from psychosocial factors to SCP, to the best of our knowledge, few scholars have systematically investigated eventual differences in terms of gender. However, previous studies extensively explored the gender role in influencing these paths in terms of more general sustainable purchasing. To illustrate, compared to men, women have more positive attitude towards sustainable purchasing compared to man[82], are more influenced by injunctive norms (perceived societal approval) in sustainable purchasing behaviors[83,84], and have a stronger moral obligation towards sustainable purchasing[85]. Their high green self-identity strongly motivates them to buy sustainable apparel[86]. In contrast, men are more influenced by descriptive norms (observing others' behaviors)[87], have a less pronounced environmental self-identity and often fear being judged as "feminine" if they engage in eco-friendly behaviors[88]. Overall, these gender differences highlight the need to consider gender when understanding the determinants of sustainable clothing purchasing intentions and behaviors. Given the absence of studies that have compared the influence of each psychosocial predictor considered in this study and their interaction with proenvironmental self-identity, while accounting

Fig. 1. Hypothesized model paths for intention towards sustainable clothing purchasing behaviors.
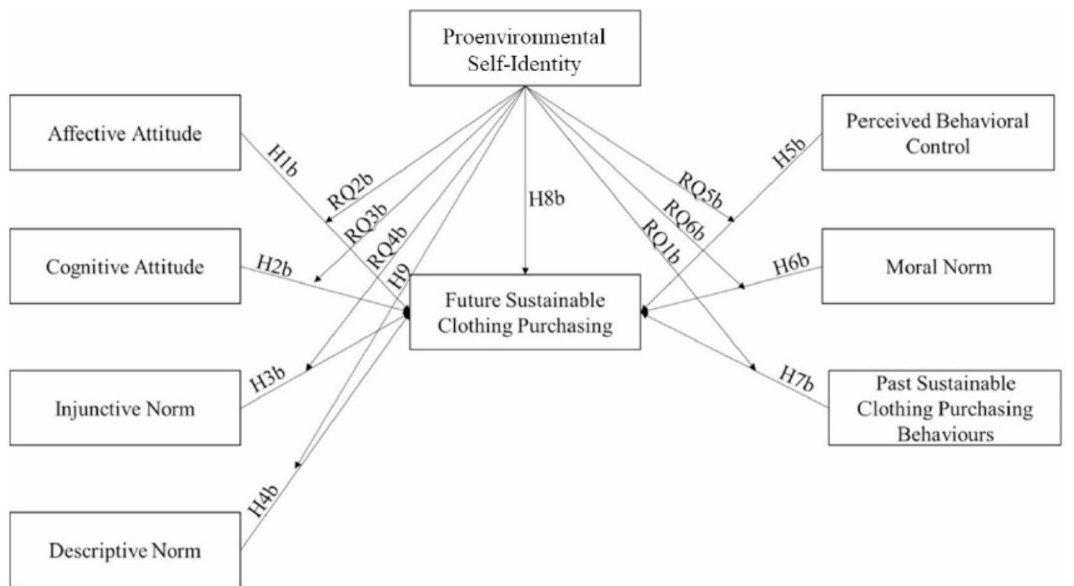
Fig. 2. Hypothesized model paths for future sustainable clothing purchasing.

for potential gender differences, and considering that studies on sustainable purchasing in general have shown gender differences, we propose the following research question:

How do gender differences affect the influence of psychosocial predictors (affective attitude – *RQ7a*, cognitive attitude – *RQ7b*, injunctive norm – *RQ7c*, descriptive norm – *RQ7d*, perceived behavioral control – *RQ7e*, moral norm – *RQ7f*, proenvironmental self-identity and its interactions with other predictors – *RQ7g*) on sustainable fashion choices?

Methods
Procedure and participants
Following the Declaration of Helsinki, the present study was conducted after obtaining ethical approval from the Ethical Committee for Research in Psychology (CERP) of the Catholic University of the Sacred Heart in Milan. In November 2022, about 400 participants were invited to participate in this study thanks to master's degree students attending the course in Social Psychology of Eating. Neither recruiting students nor participants received any compensation. Inclusion criteria required buying at least 10 clothing items per year for oneself. At

Time 1 (T1), 280 participants gave informed consent to participate in the study and completed a questionnaire measuring TPB constructs (attitude, social norm, perceived behavioral control, and intention) and additional variables (past behavior and proenvironmental self-identity) for each of the three clothing purchasing behaviors: Buying eco-friendly clothes (i.e. buying clothes made from eco-friendly and sustainable materials, fabrics, or textures, with a focus on reducing environmental impact), buying second-hand clothes (i.e. buying clothes that were already in your possession, often as a sustainable and cost-effective alternative to new purchases), and buying high-quality clothes (i.e. buying clothes that are known for their superior quality, durability, and workmanship). After one month, i.e. at Time 2 (T2), participants were asked to complete a second short questionnaire in which we measured consumers' current SCP. The data analysis was then conducted only with the participants who had completed both questionnaires (N = 265).

The final sample was characterized by a higher number of women ($n = 181$) compared to men ($n = 83$), with one participant not disclosing their gender. The age of the participants ranged from 18 to 64 years, with a mean age of 29.99 ($SD = 12.93$). The sample exhibited a medium to high level of education, with most participants holding a high school diploma (29%), a bachelor's degree (24%), or attending university without obtaining a degree (27%). Additionally, 14% of participants held a master's degree, while 2% had a lower secondary school diploma, and 2% preferred not to disclose their educational background. In terms of marital status, most respondents reported cohabiting (61%), followed by those who were separated or divorced (21%), married (9%), widowed (1%), single (0.4%), and a small portion who chose not to disclose their marital status (7%). Table 1 reports the demographics of the total, female, and male samples.

Measures

We performed Multilevel Confirmatory Factorial Analyses to test the model's validity and reliability. The scales resulting from these analyses, which were used in the main analyses, are detailed in Table 3 of the Supplementary Information.

Intention towards SCP was measured by asking participants to rate their intention to choose eco-friendly clothing, second-hand clothing, and high-quality clothing over the next month ("I intend to purchase eco-friendly/ high-quality/ second-hand clothing… Strongly disagree (1)—Strongly agree (7)"). These items were adapted from[2].

Cognitive and Affective Attitudes towards sustainable clothing purchasing behaviors were assessed as the mean of two items using a semantic differential scales (items for cognitive attitude: "Making sustainable/second-hand/ high-quality purchasing choices to protect the environment is… Foolish (1)—Wise (7)", "Making sustainable/ second-hand/high-quality purchasing choices to protect the environment is… Useless—Useful"; items for affective attitude: "Making sustainable/second-hand/high-quality purchasing choices to protect the environment is… Unsatisfactory (1)—Satisfactory (7)", "Making sustainable/second-hand/high-quality purchasing choices to protect the environment is… Unpleasant (1)—Pleasant (7)"). These items were adapted from[64].

Injunctive and Descriptive Norm were measured using one item per purchasing behaviour (item for injunctive norm: "Most of the people I know (family, friends) would approve if I bought eco-friendly /second-hand/ high-quality clothing… Strongly disagree (1)—Strongly agree (7)"; item for descriptive norm: "Most of the people I know (family, friends) buy eco-friendly /second-hand/ high-quality clothing … Strongly disagree (1)—Strongly agree (7)"). These items were adapted from[2].

Factor	Total Sample	Female Sample	Male Sample
Gender			
Women	181		
Men	83		
Age			
M	29.99	29.62	34.39
SD	12.39	13.26	14.38
Educational level			
% Lower-secondary education	2	2	7
% High school diploma	29	1.6	2.4
% Attending the university without degree	27	22	43
% BA degree	24	31	16
% MA degree	14	28	14
% Not disclosed	2	15	17
Marital status			
% Single	.40	64	51
% Cohabiting	61	8	12
% Married	9	18	28
% Divorced or separated	21	3	8
% Widowed	1	6	0

Table 1. Demographics of study sample. *M*, Mean; *SD*, Standard Deviation.

Predictors	B	SE	t-ratio	p-value
Model 1 a				
Intercept β_{00}	.984	.580	1.697	.179
Affective attitude β_{10}	-.040	.037	-1.087	.277
Cognitive attitude β_{20}	.023	.037	.618	.537
Injunctive norm β_{30}	.207	.038	5.511	<.001
Descriptive norm β_{40}	.205	.036	5.774	<.001
Perceived behavioural control β_{50}	.033	.043	.775	.439
Moral norm β_{60}	.374	.040	9.279	<.001
Past sustainable clothing purchasing β_{70}	-.170	.088	-1.941	.053
Model 1 b				
Intercept β_{00}	.840	.883	.950	.434
Affective attitude β_{10}	-.037	.036	-1.024	.306
Cognitive attitude β_{20}	.027	.036	.752	.452
Injunctive norm β_{30}	.203	.037	5.434	<.001
Descriptive norm β_{40}	.202	.035	5.728	<.001
Perceived behavioural control β_{50}	-.045	.043	-1.034	.302
Moral norms β_{60}	.341	.042	8.025	<.001
Past Sustainable clothing purchasing β_{70}	-.195	.087	-2.230	.026
Proenvironmental self-identity β_{01}	.099	.089	1.116	.365
Cross-level interactions with proenvironmental self-identity in model 1 b				
Affective attitude β_{11}	-.133	.035	-3.809	<.001
Cognitive attitude β_{21}	.093	.035	2.638	.009
Injunctive norm β_{31}	-.049	.033	-1.485	.138
Descriptive norm β_{41}	-.083	.031	-2.691	.007
Perceived behavioural control β_{51}	-.038	.041	-.934	.351
Moral norms β_{61}	.139	.036	3.907	<.001
Past sustainable clothing purchasing β_{71}	.085	.091	.928	.354

Table 3. Multilevel analysis of predictors of intentions towards sustainable clothing purchasing including cross-level analyses. *Note.* B = unstandardized coefficient; SE = standard error.

Perceived Behavioral Control towards SCP was calculated as the mean of three items per clothing purchasing behaviour ("When buying eco-friendly/second-hand/high-quality clothing, how much do feel to control the following obstacles: Outdated appearance; High price; Difficulties in finding retailers"), using a scale from "Not at all' (1) to 'A lot' (7). These items were adapted from[2].

Moral Norms were measured using one item per SCP ("Buying eco-friendly/ second-hand/ high quality clothing means acting in line with my principles… Strongly disagree (1)—Strongly agree (7)"). These items were adapted from[65].

Proenvironmental Self-Identity was measured as the mean of 6 items ("I think of myself as someone who is concerned about proenvironmental issues, such as… Excessive use of the planet's natural resources (air, water, soil…) for food production; Pollution of natural resources in clothing production; Excessive clothing consumption; Use of non-recyclable materials for clothing production; Excessive use of synthetic materials for fabrics; Greenhouse gas emissions from clothing production and transportation") rated on a scale ranging from "Strongly disagree" (1) to "Strongly agree" (7). These items were adapted from[66].

Sustainable Clothing Purchasing was assessed by inviting participants to specify the quantity of eco-friendly, second-hand, and high-quality clothing purchased in the last month ("Indicate how many eco-friendly clothing/ second-hand clothing/ high-quality clothing (e.g., dresses, t-shirt, pants, etc.) you have purchased in the last month"). Missing values were replaced with 0, and the total number of items reported was summed. In this study, SCP at T1 was defined as *past SCP* and SCP at T2 as *current SCP*.

Analyses

The data were analysed with R version 4.3.0. Initial analyses including descriptive statistics, reliability tests, and intercorrelations were conducted for all variables and scales (Table 2). A multilevel confirmatory factor analysis (MCFA), incorporating the ten factors under consideration, was subsequently performed to assess the reliability of the scales. Multivariate normality was evaluated using Mardia's tests of skewness and kurtosis[89], and a maximum likelihood estimator with robust standard errors was utilized[90]. Composite reliability was assessed referring to Cronbach's alpha values > 0.70[91–94] and construct reliability (CR) > 0.7[93] Convergent validity was assessed according to Anderson & Gerbing (1988)[92] and Dunn et al. (1994)[93] guidelines about factor loadings at least equal to 0.40, and according to Fornell & Larcker (1981)[91] criterion, for which the average variance extracted (AVE) should be at least 0.5. Divergent validity was assessed following Rönkkö and Cho (2022)[94] recommendations. The MCFA was performed using the Lavaan package version 0.6.16[95]. The model's overall fit

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Intention	4.33	1.74									
2. Affective Attitude	5.04	1.77	.01 [-.07, .07]								
3. Cognitive Attitude	5.61	1.71	.14** [.07, .21]	.64** [.59,.68]							
4. Injunctive Norm	4.3	1.57	.32** [.25, .38]	.02 [-.04, .09]	.03 [-.04, .10]						
5. Descriptive Norm	3.87	1.61	.44** [.38, .49]	-.07* [-.14, -.01]	.02 [-.05, .09]	.48** [.43, .53]					
6. Perceived Behavioural Control	2.84	1.11	.07 [-.01, ,14]	.04 [-.03, .11]	.12** [.05, .19]	-.02 [-.09, .05]	.02 [-.05, .09]				
7. Moral Norm	4.45	1.35	.35** [.29, .41]	.38* [.31, .43]	.33** [.27, .39]	.29** [.21, .34]	.13** [.06, .19]	.11** [.05, .18]			
8. Past Sustainable Clothing Purchasing	2.55	.56	-.14* [-.20, -.07]	.14** [.07, .21]	.01 [-.06, .08]	.03 [-.04, .10]	-.03 [-.10, .04]	.04 [-.03, .11]	.05 [-.02, .12]		
9. Future Sustainable Clothing Purchasing	2.83	.68	-.11* [-.18, -.04]	.09* [.02, 15]	-.05 [-.11, .02]	.02 [-.05, .09]	.01 [-.07, .07]	-.01 [-.07, .07]	.01 [-.07, .07]	.37** [.31, .43]	
10. Proenvironmental Self-Identity	5.18	1.05	.20** [.13, .26]	.16** [.09, .23]	.17** [.10, .23]	.16** [.09, .23]	.06 [-.01,.13]	.15** [-.08, .21]	.41** [.35, .47]	.11* [.04, .18]	.06 [-.01, .13]

Table 2. Means, standard deviations, factor correlation estimates, and confidence intervals for the total sample. *Note. M* and *SD* are used to represent mean and standard deviation, respectively. Within person variables ($N_{observations} = 795$); Between person variables ($N_{participants} = 265$); For within person variables by between person variables we repeat the between variables for each behaviour (r is based on 3 X N). * $p < .05$. ** $p < .01$.

was assessed based on the chi-square/df ratio (< 2.0), the Comparative Fit Index (CFI) by Bentler (1990)[96] (> 0.90), the Tucker–Lewis index (TLI; > 0.90[97,98]) the Root Mean Square Error of Approximation (RMSEA) (< 0.10[99]), and the Standardized Root Mean Square Residual (SRMR) (< 0.08[99]).

We then considered the simultaneous influence of predictors at different levels through multilevel modelling: three SCP variables (i.e. eco-friendly, used and quality clothing) (level-1) and SCP within individuals on the outcome variable (level-2). This approach avoids the methodological problems associated with traditional techniques[100]. Multilevel modelling with random effects enables the treatment of the problem of dependence on observations, the estimation of a correct standard error and thus a more appropriate significance test[101,102]. The advantages of multilevel modelling analyses have been convincingly demonstrated in previous TPB studies[103].

To run our multi-behavior model, we employed hierarchical linear models implemented with the *lme4* and *lmerTest* packages[104]. To decipher significant interaction terms, we decomposed them to obtain simple slopes using an *effect* package[105]. Plots were generated using several packages, including *ggeffects*, *jtools* and *forcats*[105–107]. Model comparisons were performed using the ANOVA function. For our analyses, we utilized 250 observations, corresponding to 750 within-person behaviors related to the purchasing of eco-friendly, second-hand, or high-quality clothing. Each multilevel model accounted for two levels. At Level 1, representing within-person factors, we included cognitive and affective attitudes, injunctive and descriptive norms, perceived behavioral control, moral norm, and past behavior. At Level 2, representing between-person factors, we included proenvironmental self-identity. Level 1 predictors were centred around the group mean, while Level 2 variables were centred around the grand mean[108]. To check the moderation effect we chose high and low levels of proenvironmental self-identity corresponding to one standard deviation unit below and above its average, respectively.

To assess the models implemented in our study, we employed a full unconditioned model for comparison, utilizing a chi-square statistic[108]. Subsequently, we used the deviance value as the foundation for evaluating model fit. A substantial reduction in deviance (-2LL) indicates a significant enhancement in model fit, while a minor reduction suggests insignificant improvement[108]. In the area of proenvironmental behaviors, some scholars showed that accounting for multiple proenvironmental behaviors using within-subject analyses across multiple behaviors and a longitudinal design was effective in predicting proenvironmental intentions and behaviors and tested the moderating effect of proenvironmental self-identity[109].

Finally, to check for differences across gender, we replicated those analyses as multigroup multilevel models.

Results
Preliminary analyses
The Mardia's tests of skewness and kurtosis[89] indicated that the assumption of multivariate normality was not met (Skewness test: $_{1,p} = 93.51$, $p < 0.001$; Kurtosis test: $_{2,p} = 741.823$, $p < 0.001$). As a result, a maximum likelihood estimator with robust standard errors was employed. The MCFA showed a poor fit ($\chi^2(74) = 317.518$, $p < 0.001$; $\chi^2/df = 5293$; CFI = 0.953; TLI = 0.914; RMSEA = 0.064, 90% CI [0.057, 0.072]; $SRMR_{within} = 0.047$, $SRMR_{between} = 0.049$), with some standardized factor loadings below 0.40 (see Supplementary Table 1 online). We performed a second MCFA removing two items with factor loading lower than 0.40 (Item 1 from perceived behavioral control, $B = 0.366$, and item 3 from moral norm, $B = 0.359$; see Supplementary Table S2 online). The new fit improved, ($\chi^2(106) = 115.136$, $p < 0.001$; $\chi^2/df = 4982.354$; CFI = 0.986; TLI = 0.968; RMSEA = 0.043, 90% CI [0.033, 0.053]; $SRMR_{within} = 0.019$, $SRMR_{between} = 0.049$). However, item 3 from perceived behavioral control showed a factor loading, $B = 0.232$, below the acceptable cut-off[91]. Therefore, following the recommendations of

Hayduk & Littvay (2012)[110], who suggest to retain the indicator by transforming it into a single indicator instead of removing it from the model, we proceeded by removing this further item and we performed a third MCFA. To define perceived behavioral control we used the most representative item (see Supplementary Table S3 online). The third MCFA revealed a good fit ($\chi^2(93) = 97.781$, $p < 0.001$; $\chi^2/df = 1922.126$; CFI = 0.987; TLI = 0.968; RMSEA = 0.041, 90% CI [0.031, 0.046]; $SRMR_{within} = 0.015$, $SRMR_{between} = 0.049$). Finally, we tested the model for composite reliability, convergent and divergent validity. Composite reliability and convergent validity were met: all the factor loadings were above 0.04, the CR values were all equal or above 0.07, and the AVE values surpassed the threshold of 0.05. Likewise, divergent validity was met: the upper limits (and lower limits for negative correlations) of the 95% confidence intervals (CI) for the estimated factor correlations were below the cutoff of 0.80 (see Table 2). Correlations, means and standard deviations for the total sample are shown in Table 2, the ones for the female and male samples are shown in Supplementary Tables S3 and S4 online.
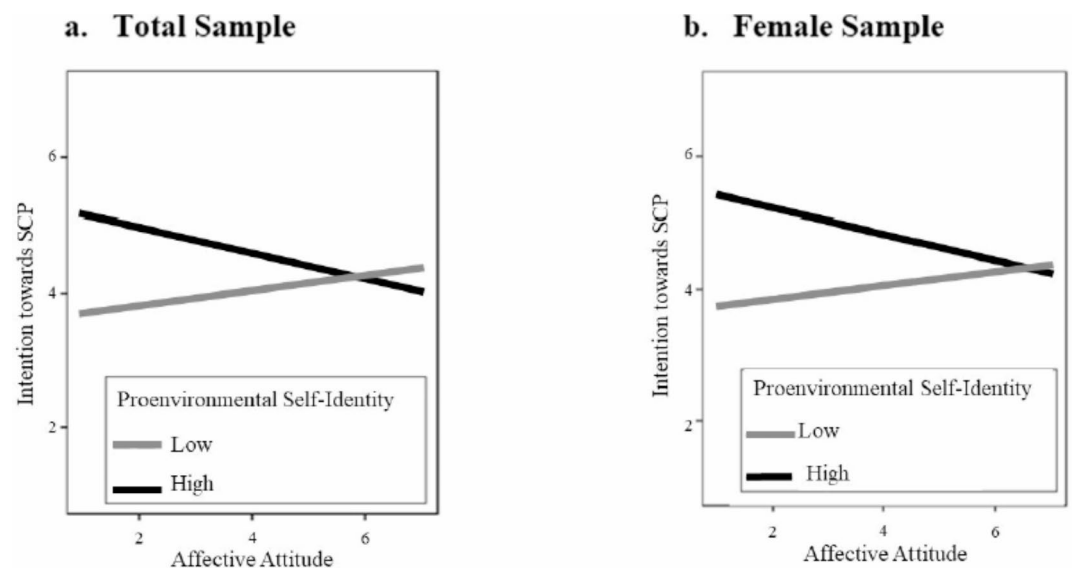
Explaining intentions towards sustainable clothing purchasing

Table 3 shows the results of the predictors influencing intentions towards SCP. To test the main effects, intentions were first regressed on the Level 1 variables (Model 1a) and then on both the Level 1 and Level 2 variables (Model 1b). Model 1a ($\chi^2 = 2669.4$, $df = 249$, $p < 0.001$) significantly reduced the deviance statistic compared to the intercept-only model ($\Delta\chi^2 (8) = 461.29$, $p < 0.001$). At this stage, moral norm proved to be the strongest and most positive predictor of consumers' purchase intentions, followed by injunctive and descriptive norms. Thus, we confirmed *H6a*, *H3a* e *H4a*. Neither cognitive or affective attitude nor perceived behavioral control or past SCP were found to be significant predictors of consumers' SCP intentions. Thus, we disconfirmed *H1a*, *H2a* and *H4a*. Moreover, past SCP did not predict consumers' intentions (*RQ1a*).

The addition of the Level 2 variable proenvironmental self-identity (Model 1b) and its interaction with the variables of Model 1a further reduced the deviance statistic ($\Delta\chi^2 (8) = 43.657$, $p < 0.001$). Similar to Model 1a, consumers' injunctive (*H3a*), descriptive (*H4a*), and moral (*H6a*) norm remained the strongest and most positive predictors of their purchase intentions. In addition, consumers' past SCP (*RQ1a*) was a significant and negative predictor of their intentions. Consumers' affective (*H1a*) and cognitive (*H2a*) attitude, perceived behavioral control (*H5a*), and proenvironmental self-identity (*H8a*) were not significant predictors of purchase intentions. The introduction of proenvironmental self-identity (Model 1b) and its interaction with the existing variables significantly reduced the variance statistic, indicating an improved model fit. In particular, while injunctive norm lost their significant effect, consumers' moral and descriptive norms retained their strong positive influence on purchase intentions. In addition, both affective and cognitive attitudes became significant negative and positive predictors of purchase intentions, respectively. Finally, the negative effect of past purchasing behavior lost its significance.

The decomposition of the interaction terms revealed nuanced patterns. Participants with high levels of proenvironmental self-identity and high levels of affective attitudes had lower purchase intentions ($M—1sd$; $B = -0.52$, $p < 0.001$). Conversely, participants with low levels of proenvironmental self-identity and high levels of affective attitudes had higher purchase intentions ($M—1sd$; $B = 0.80$, $p < 0.001$) (*RQ2a*) (see Fig. 3).
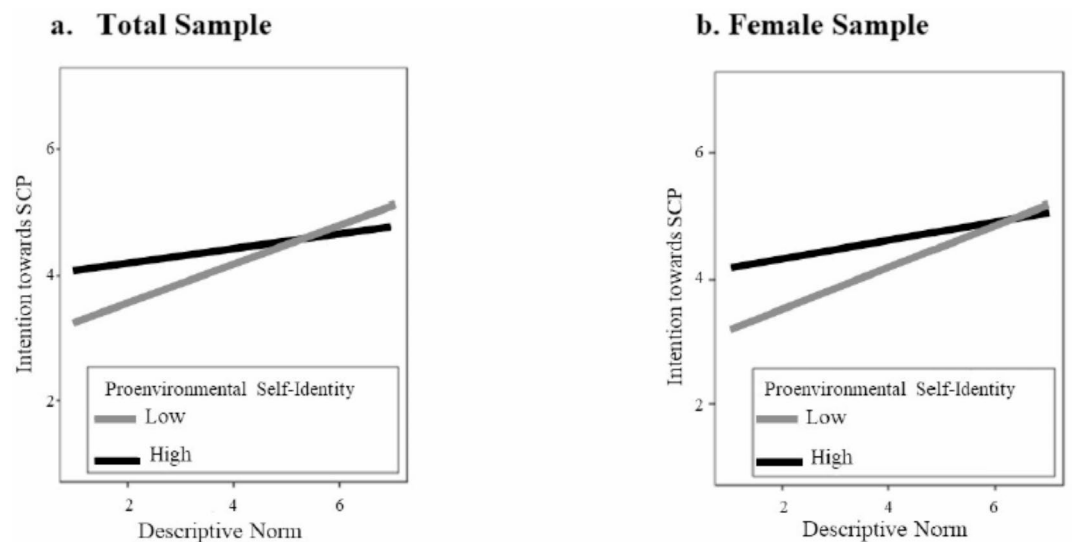
When proenvironmental self-identity was lowest, consumers' cognitive attitude had a negative effect on intentions ($M—1sd$; $B = -0.54$, $p < 0.001$), whereas when proenvironmental self-identity was highest, they had a positive effect on intentions ($M + 1sd$; $B = 0.34$, $p < 0.001$) (*RQ3a*) (see Fig. 4).

Fig. 3. Simple slopes for affective attitude on intention towards sustainable clothing purchasing by proenvironmental self-identity for the total sample and the female sample. *Note.* SCO, sustainable clothing purchasing.
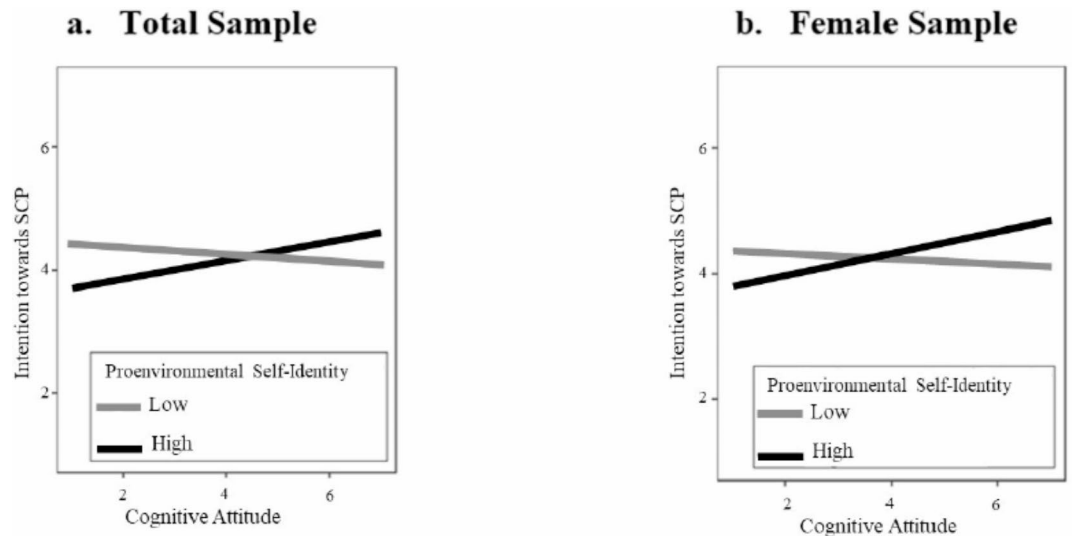
Fig. 4. Simple Slopes for cognitive attitude on intention towards sustainable clothing purchasing by proenvironmental self-identity for the total sample and the female sample. *Note.* SCO, sustainable clothing purchasing.

Fig. 5. Simple slopes for descriptive norm on intention towards sustainable clothing purchasing by proenvironmental self-identity for the total sample, and the female sample. *Note.* SCO, sustainable clothing purchasing.

These results emphasised that the levels of proenvironmental self-identity affect the impact of affective attitude on purchasing intentions. Positive affective attitudes predicted peoples' intention to purchase sustainable fashion only when they have a weak proenvironmental self-identity. Conversely, the moderating effect of proenvironmental self-identity was reversed for cognitive attitude, which relates more to how useful behavior is (rather than how pleasurable). Positive cognitive attitudes predicted peoples' intention to purchase sustainable fashion only when they have a strong proenvironmental self-identity.

The influence of descriptive norm on intentions weakened the higher the level of proenvironmental self-identity was, with the strongest influence at the lowest level of proenvironmental self-identity ($M—1sd$; $B = -0.73$, $p < 0.001$) ($H9c$) compared to the highest level ($M—1sd$; $B = 0.56$, $p < 0.001$) ($H9a$) (see Fig. 5). The results confirmed our hypotheses. In particular, high descriptive norm showed a positive relationship with intention when proenvironmental self-identity reached its peak. This positive effect became even more pronounced when proenvironmental self-identity was at its lowest. In such cases, the low descriptive norm was associated with lower intention for SCP.

The effect of moral norm on purchase intentions only significant and positive at the highest levels of proenvironmental self-identity ($M + 1sd$; $B = 0.25$, $p < 0.001$), but not at the lowest levels ($M—1sd$; $B = 0.07$, $p = 0.11$) (*RQ6a*; see Fig. 6). It appears that individuals who have a strong proenvironmental self-identity also hold stronger moral norms, leading to an increased purchase intention.

We found no significant effects for either injunctive norm (*RQ4a*), perceived behavioral control (*RQ5a*), or past behavior (*RQ1a*).

Overall, on one hand, it seems that people with strong proenvironmental self-identity are less affected by affective attitude and descriptive norms, but positively affected by cognitive attitude and moral norms intend to purchase more sustainable clothing. On the other hand, people with weak proenvironmental self-identity are more affected by affective attitude and descriptive norms, and negatively affected by cognitive attitude, but not by moral norm.

Explaining gender differences in intentions towards sustainable clothing purchasing
Additionally, we performed multigroup models to investigate the presence of gender differences in our results. Table 4 shows the following results. In Model 1a, the only divergent result from the same model calculated using the whole sample was the significant effect of past behavior for women, but not for men. Past behavior had a significant negative effect on women's purchase intentions. In Model 1b, as for the whole sample, injunctive, descriptive, and moral norms were significant predictors of purchase intentions for both women and men (*RQ7b, RQ7c, RQ7f.*). Again, the significant effect of past behavior on intention found for the whole sample seems to be exclusively related to the female sample. Finally, when it comes to the interactions with proenvironmental self-identity (*RQ7g*), the same interactions found to be significant for the whole sample (affective and cognitive attitude, descriptive and moral norms) were only significant for women).

Regarding the interaction between proenvironmental self-identity and affective attitude on purchasing intention, women with a high proenvironmental self-identity and high levels of affective attitudes had lower purchase intentions ($M—1sd$; $B = -0.63$, $p < 0.001$), conversely, those with a low proenvironmental self-identity and high levels of positive affective attitudes had higher purchase intentions ($M—1sd$; $B = 1.09$, $p < 0.001$; Fig. 3).

As for the interaction between proenvironmental self-identity and cognitive attitude purchasing intention, women with low levels of proenvironmental self-identity and low positive cognitive attitude had lower purchase intentions ($M—1sd$; $B = -0.66$, $p < 0.001$), but women with a high proenvironmental and high positive cognitive attitude had greater purchase intentions ($M + 1sd$; $B = 0.28$, $p < 0.001$; Fig. 4).

Again, for women the effect of proenvironmental self-identity on the relationship between descriptive norms and purchase intention was confirmed. Women with strong descriptive norm and low proenvironmental self-identity intended to purchase more ($M—1sd$; $B = 0.78$, $p < 0.001$) compared to women with weak descriptive norm and low proenvironmental self-identity ($M—1sd$; $B = -0.60$, $p < 0.001$; Fig. 5).

Finally, in line with the findings registered for the model performed using the whole sample, women with high moral norm and high proenvironmental self-identity showed higher purchase intentions ($M—1sd$; $B = 0.47$, $p < 0.001$) compared to those with low levels of proenvironmental self-identity and low moral norms ($M—1sd$; $B = -0.22$, $p < 0.001$; Fig. 6).

Overall, it seems that men are less sensitive to the moderating effect of proenvironmental self-identity in affecting their purchase intentions.
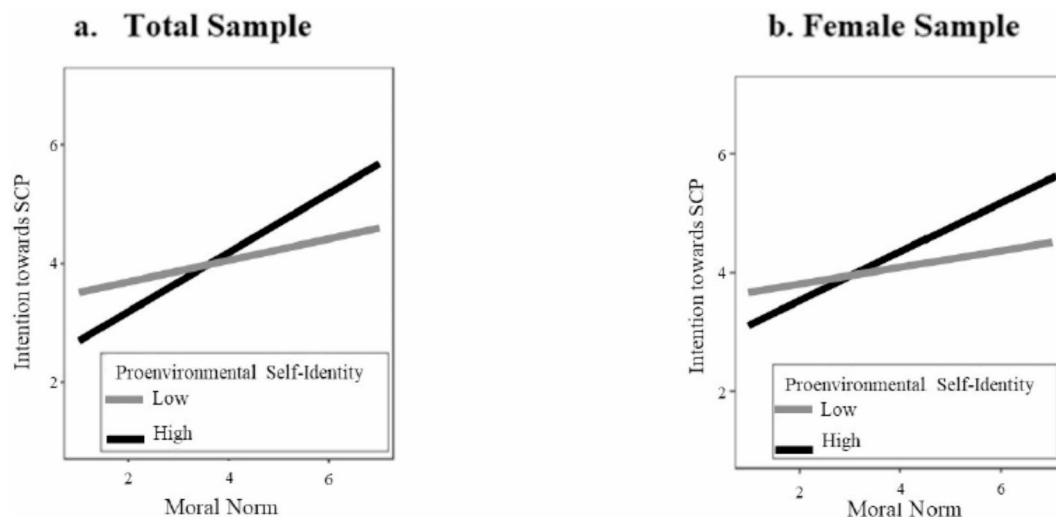
Fig. 6. Simple slopes for moral norm on intention towards sustainable clothing purchasing by proenvironmental self-identity for the total sample and the female sample. *Note* SCO, sustainable clothing purchasing.

Predictors	Women				Men			
	B	SE	t-ratio	p-value	B	SE	t-ratio	p-value
Model 1 a								
Intercept β_{00}	1.212	.565	2.147	.094	1.231	.752	1.636	.178
Affective attitude β_{10}	-.059	.044	-1.345	.179	-.035	.066	-.532	.595
Cognitive attitude β_{20}	.045	.045	.995	.320	.013	.065	.206	.837
Injunctive norm β_{30}	.227	.046	4.890	<.001	.158	.066	2.393	.018
Descriptive norm β_{40}	.228	.043	5.302	<.001	.164	.064	2.564	.011
Perceived behavioural control β_{50}	-.054	.054	-.997	.320	.012	.074	.164	.870
Moral norm β_{60}	.352	.050	7.033	<.001	.390	.072	5.389	<.001
Past sustainable clothing purchasing β_{70}	-.244	.106	-2.304	.022	-.037	.158	-.235	.814
Model 1 b								
Intercept β_{00}	.416	.892	.467	.677	1.099	.866	1.269	.298
Affective attitude β_{10}	-.044	.044	-.994	.321	-.022	.065	-.338	.735
Cognitive attitude β_{20}	.046	.044	1.046	.296	.009	.065	.135	.893
Injunctive norm β_{30}	.220	.046	4.804	<.001	.157	.066	2.400	.017
Descriptive norm β_{40}	.226	.042	5.327	<.001	.161	.064	2.527	.012
Perceived behavioural control β_{50}	.003	.053	.065	.949	.107	.073	1.482	.140
Moral norms β_{60}	.274	.053	5.135	<.001	.411	.073	5.620	<.001
Past sustainable clothing purchasing β_{70}	-.291	.106	-2.751	.006	-.031	.159	-.195	.846
Proenvironmental self-identity β_{01}	.180	.087	2.069	.126	-.054	.093	-.573	.619
Cross-level interactions with proenvironmental self-identity in model 1 b								
Affective attitude β_{11}	-.132	.037	-3.541	.000	-.089	.070	-1.285	.200
Cognitive attitude β_{21}	.094	.039	2.404	.017	.113	.070	1.624	.106
Injunctive norm β_{31}	-.015	.034	-.432	.666	-.095	.064	-1.497	.136
Descriptive norm β_{41}	-.085	.034	-2.528	.012	-.109	.058	-1.881	.061
Perceived behavioural control β_{51}	.004	.047	.092	.927	-.119	.071	-1.671	.096
Moral norms β_{61}	.118	.040	2.939	.004	.129	.071	1.824	.070
Past sustainable clothing purchasing β_{71}	.159	.105	1.510	.132	-.039	.155	-.249	.804

Table 4. Multigroup multilevel analysis of predictors of intentions towards sustainable clothing purchasing cross-level analyses between women and men. B, unstandardized coefficient; SE, standard error.

Explaining sustainable clothing purchasing

Table 5 shows the results of the predictors influencing participants' future SCP. To examine the primary effects, the current SCP were first regressed on the Level 1 variables (Model 2a) and then on the Level 1 and 2 variables, including their interaction (Model 2b). Model 2a ($\chi^2 = 1393.8$, $df = 249$, $p < 0.001$) significantly reduced the deviance statistic compared to the intercept-only model ($\Delta\chi^2$ (9) = 122.68, $p < 0.001$). In this model, we found three predictors to be statistically significant. Both affective (*H1b*) and cognitive (*H2b*) attitudes had a modest influence on future SCP, with the former having a positive, and the latter a negative influence. In addition, past SCP proved to be the strongest predictor of future SCP (H7b), which was in line with our expectations. Model 2b, which included interaction terms between the variables from Model 2a and the sustainable intentions variable at level 2, further reduced the deviance statistic ($\Delta\chi^2$ (11) = 24.03, $p < 0.001$).

The main effects in Model 2b confirmed the results from Model 2a, all other predictors, including proenvironmental self-identity were found to be non-significant (*H3b, H4b, H5b, H6b, H8b*). Furthermore, Model 2a revealed an additional significant interaction term between proenvironmental identity and past SCP. Figure 7 illustrates the decomposition of this interaction term. The effect of past SCP on future SCP is more pronounced at lower levels of proenvironmental self-identity ($M - 1sd$; $B = 0.28$, $p < 0.001$) and decreases when proenvironmental self-identity reaches a higher level ($M + 1sd$; $B = 0.19$, $p < 0.001$) (*RQ1b*). No other significant interaction effects were found that did not confirm other hypotheses and research questions (*H9d, RQ2b, RQ3b, RQ4b, RQ5b, RQ6b*).

The patterns observed for future behavior differed from those found for intention and included variations in both main and interaction effects. While intention was influenced by normative predictors, future behavior was primarily influenced by affective attitude. Furthermore, while in the case of intention, proenvironmental self-identity interacted significantly with several other variables, in the case of future behavior only the interaction with past behavior was found to be significant.

Explaining gender differences in sustainable clothing purchasing
When considering the multigroup models (see Table 6), Model 2a revealed a contrasting pattern compared to the models examining purchase intentions, as it was confirmed only for the female sample. In contrast, the model tested with women indicated that the only significant and positive predictor was past behavior. It appears

Predictors	B	SE	t-ratio	p-value
Model 2 a				
Intercept β_{00}	.232	.146	1.594	.114
Intention β_{10}	-.023	.015	-1.515	.131
Affective attitude β_{20}	.040	.016	2.487	.013
Cognitive attitude β_{30}	-.036	.017	-2.102	.036
Injunctive norm β_{40}	.010	.017	.601	.548
Descriptive norm β_{50}	.020	.017	1.184	.237
Perceived behavioural control β_{60}	-.013	.021	-.608	.543
Moral norms β_{70}	-.005	.025	-.190	.849
Past sustainable clothing purchasing β_{80}	.351	.041	8.638	<.001
Model 2 b				
Intercept β_{00}	.088	.210	.419	.685
Intention β_{10}	-.023	.015	-1.544	.125
Affective attitude β_{20}	.041	.016	2.563	.011
Cognitive attitude β_{30}	-.032	.017	-1.837	.067
Injunctive norm β_{40}	.007	.016	.404	.687
Descriptive norm β_{50}	.021	.016	1.302	.193
Perceived behavioural control β_{60}	-.013	.021	-.593	.554
Moral norms β_{70}	-.017	.026	-.653	.514
Past Sustainable clothing purchasing β_{80}	.337	.041	8.274	<.001
Proenvironmental self-identity β_{01}	.035	.042	.818	.449
Cross-level interactions with proenvironmental self-identity in model 2 b				
Intention β_{11}	-.016	.014	-1.123	.265
Affective attitude β_{21}	-.023	.016	-1.436	.152
Cognitive attitude β_{31}	.023	.017	1.362	.174
Injunctive norm β_{41}	.011	.016	.696	.491
Descriptive norm β_{51}	-.001	.016	-.064	.949
Perceived behavioural control β_{61}	-.010	.021	-.478	.633
Moral norms β_{71}	-.006	.022	-.270	.788
Past sustainable clothing purchasing β_{81}	-.156	.044	-3.555	<.001

Table 5. Multilevel analysis of predictors of future sustainable clothing purchasing including cross-level analyses.

that women were not influenced by either cognitive or affective attitudes, whereas men were (*RQ7a, RQ7b*). This trend is further supported when examining Model 2b and its interactions with proenvironmental self-identity (*RQ7g*). Specifically, when women had a low proenvironmental self-identity the effect of past SCP on future SCP was stronger ($M - 1sd$; $B = 0.35$, $p < 0.001$) and decreased when proenvironmental self-identity increased ($M - 1sd$; $B = 0.24$, $p < 0.001$; Fig. 7).

On the other hand, men with low proenvironmental self-identity and high positive affective attitude increased their future SCP ($M - 1sd$; $B = 0.61$, $p < 0.001$). Vice versa, men with high proenvironmental self-identity and low positive affective attitude decreased their future SCP ($M - 1sd$; $B = -0.44$, $p < 0.001$). In addition, men with low proenvironmental self-identity and low positive cognitive attitude increased their future SCP ($M - 1sd$; $B = 0.68$, $p < 0.001$), and men with high proenvironmental self-identity and high positive cognitive attitude decreased those behaviors ($M - 1sd$; $B = 0.27$, $p < 0.001$). Figure 8 shows those results.

Overall, it appears that while women appeared to be solely influenced by past behavior and not by any other variables — a finding consistent with the model computed using the entire sample— men were differently influenced by affective and cognitive attitudes and those effects are moderated by proenvironmental self-identity.

Discussion

The present study aimed to test the plausibility of a multi-behavior model to explain consumers' intentions and purchases of sustainable clothing (i.e., eco-friendly, second-hand, and high-quality clothing). To this end, we combined TPB variables (i.e., cognitive and affective attitude, descriptive and injunctive norm, perceived behavioral control) with moral norm, past behaviors and proenvironmental identity.

Explaining intentions to purchase sustainable clothing

Our results indicate that normative components were the most influential in predicting consumers' purchase intentions, with moral norm being the most significant predictor. This aligns with previous research emphasizing the importance of moral norm in clothing decisions[18,111,112]. Overall, our findings support existing research highlighting the crucial role of ethical considerations in sustainable consumption[8,27]. Furthermore, our analysis
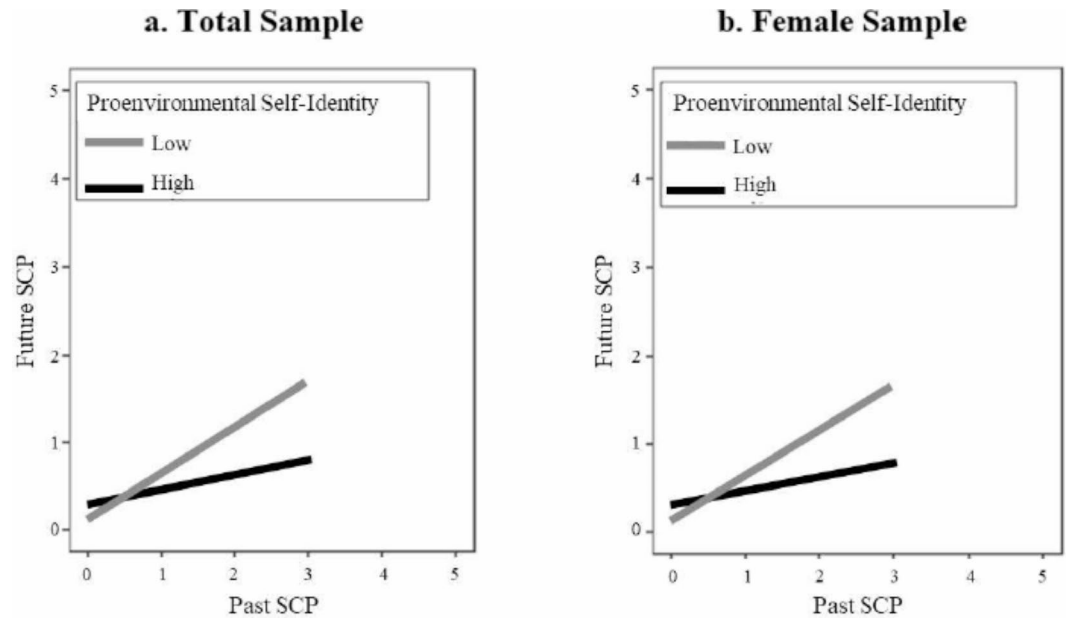
Fig. 7. Simple slopes for past sustainable clothing purchasing on future sustainable clothing purchasing by proenvironmental self-identity for the total sample and the female sample. *Note* SCO, sustainable clothing purchasing.

revealed that the influence of moral norms on purchase intentions is equally significant among both male and female consumers. This finding is consistent with the current literature, suggesting that ethical considerations in purchasing decisions are not gender-specific[113,114], indicating a broader and more universal application of ethical consumption principles. This reinforces the importance of moral norms in guiding sustainable consumer behavior.

Descriptive and injunctive norms showed significant positive effects on purchase intentions, highlighting the influence of social factors on consumers' clothing choices. Although the reliability of these norms in predicting intentions has been mixed in previous studies[18,19], our findings provide clarity, suggesting that while the influence of social norms may vary based on the specific sustainability attribute of the product, social norms overall play a crucial role in determining purchase intentions. One reason for this effect could be that social norms exert a stronger influence on behaviors visible to others[115], which is particularly relevant in fashion, where clothing choices are often displayed in social settings. Regarding gender moderation, our analysis revealed that both descriptive and injunctive norms influence purchase intentions for both women and men, but the effect is more pronounced for women. This partially aligns with existing literature, which indicated that women are generally more sensitive to injunctive norms and peer influence in their consumption decision[113,116] but men are more influenced by descriptive norms[87].

In our study, neither affective and cognitive attitude nor perceived behavioral control were significant predictors of consumer intentions. This contrasts to most TPB studies in the field of SCP[10,19]. However, it aligns with previous research that found weak or no associations between attitude, perceived behavioral control, and intentions regarding reducing clothing consumption and purchasing sustainable clothing[2,112]. Our multiple behaviors study highlights a shift away from individual-centred influences and places social norms—both perceived and internalised (moral)—at the forefront of shaping purchase intentions when integrating different SCP into a single multiple behaviors model. These findings challenge the conventional focus on individual beliefs and perceptions of control in the discourse on sustainable consumption.

We also found that past SCP was a significant negative predictor of consumer intentions. This suggests that individuals who have bought sustainable fashion in the past may express a desire to buy less in the future. One plausible explanation is dissatisfaction with previous sustainable fashion purchases, leading them to reconsider and limit future choices to avoid repeating similar experiences. Another perspective involves self-licensing and compensatory behaviors, where past virtuous actions justify subsequent less virtuous actions[117]. People often use compensatory beliefs to rationalize (or justify) behaviors inconsistent with their values or long-term goals[118,119], striking a balance between maximizing pleasure and minimizing harm[120]. These beliefs allow individuals to act in ways conflicting with their goals while maintaining the belief that they are still committed to those goals. This strategy helps maintain a positive self-image despite conflicting behaviors[121]. Much of the previous work has been conducted in the context of health goals, where people use compensatory beliefs to justify unhealthy behavior [e.g.[122]]. Applying this perspective to proenvironmental behavior suggests that individuals who have engaged in actions like buying sustainable clothing feel less obligated to continue such behaviors immediately because they believe they have already "done enough" for the environment[123,124]. Interestingly, this effect appeared only in women and not men. One potential explanation for this gender difference could be that women are generally more involved in and proenvironmental behaviors[125,126], thus experiencing a stronger

Predictors	Women				Men			
	B	SE	t-ratio	p-value	B	SE	t-ratio	p-value
Model 2 a								
Intercept β_{00}	.402	.209	1.925	.057	.135	.233	.579	.563
Intention β_{10}	-.031	.019	-1.610	.108	-.007	.020	-.369	.713
Affective attitude β_{10}	.010	.020	.512	.609	.109	.026	4.185	<.001
Cognitive attitude β_{20}	-.024	.022	-1.118	.264	-.070	.028	-2.472	.014
Injunctive norm β_{30}	.007	.022	.300	.765	.009	.024	.394	.694
Descriptive norm β_{40}	.025	.021	1.187	.236	.026	.026	1.005	.316
Perceived behavioural control β_{50}	-.032	.027	-1.189	.235	-.012	.032	-.366	.715
Moral norm β_{60}	.002	.030	.068	.946	-.049	.045	-1.112	.269
Past sustainable clothing purchasing β_{70}	.309	.051	6.026	<.001	.407	.064	6.338	<.001
Model 2 b								
Intercept β_{00}	.224	.234	.955	.341	.087	.348	.249	.807
Intention β_{10}	-.033	.019	-1.713	.088	-.011	.020	-.540	.590
Affective Attitude β_{10}	.011	.020	.542	.588	.109	.026	4.236	<.001
Cognitive Attitude β_{20}	-.021	.022	-.983	.326	-.067	.028	-2.357	.019
Injunctive Norm β_{30}	.004	.021	.198	.843	.010	.024	.416	.678
Descriptive Norm β_{40}	.026	.021	1.249	.212	.025	.026	.964	.336
Perceived behavioural control β_{50}	-.031	.027	-1.162	.246	-.008	.032	-.259	.796
Moral norms β_{60}	-.016	.032	-.493	.623	-.050	.045	-1.096	.276
Past sustainable clothing purchasing β_{70}	.298	.052	5.782	<.001	.382	.065	5.924	<.001
Proenvironmental self-identity β_{01}	.049	.039	1.251	.226	.008	.059	.139	.893
Cross-level interactions with proenvironmental self-identity in model 2 b								
Intention β_{11}	-.019	.017	-1.136	.257	.001	.021	.065	.949
Affective Attitude β_{11}	-.011	.018	-.596	.551	-.079	.029	-2.691	.008
Cognitive Attitude β_{21}	.005	.019	.274	.784	.100	.031	3.226	.001
Injunctive norm β_{31}	.013	.016	.794	.428	.008	.026	.290	.772
Descriptive norm β_{41}	.001	.018	.077	.939	-.009	.027	-.333	.740
Perceived behavioural control β_{51}	.006	.024	.265	.791	-.021	.032	-.679	.498
Moral norms β_{61}	.003	.024	.144	.886	-.042	.041	-1.018	.311
Past sustainable clothing purchasing β_{71}	-.158	.054	-2.936	<.001	-.104	.060	-1.746	.082

Table 6. Multigroup multilevel analysis of predictors of future sustainable clothing purchasing including cross-level analyses between women and men. B, unstandardized coefficient; SE, standard error.
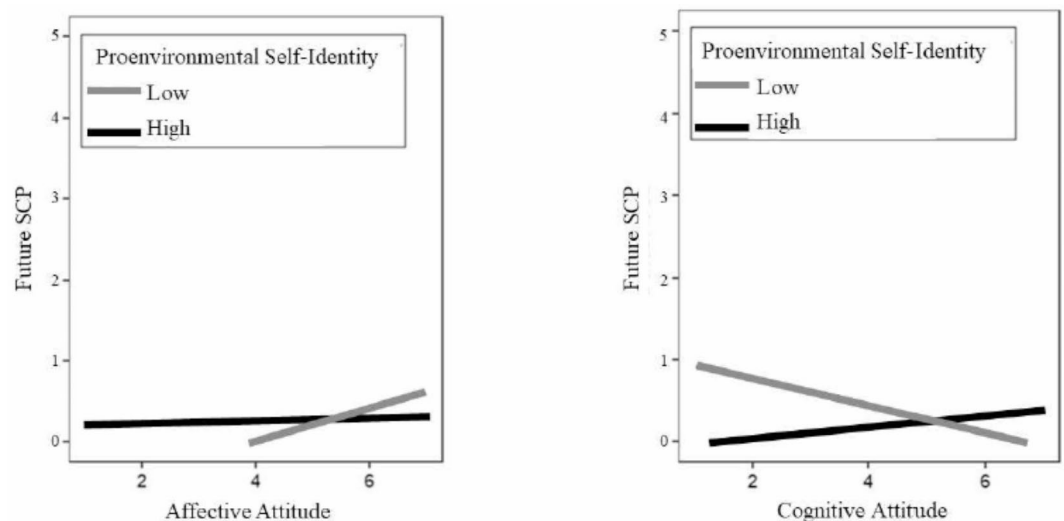
Fig. 8. Simple slopes for affective and cognitive attitude on future sustainable clothing purchasing by proenvironmental self-identity for the male sample. *Note.* SCO, sustainable clothing purchasing.

initial commitment towards sustainable fashion. This heightened engagement may lead to a greater sense of having fulfilled their environmental duty, triggering compensatory beliefs more readily than in men. Moreover, social and psychological factors, such as societal expectations for women to adhere to ethical consumption and environmental stewardship, might contribute to this discrepancy. Women often face stronger social pressures to maintain ethical standards, and they may experience greater relief from these pressures through compensatory behaviors after initial proenvironmental actions.

Examining the interaction effects between proenvironmental self-identity and other predictors revealed gender-specific dynamics in how these factors influence purchase intentions, with notable patterns emerging exclusively among female participants.

Women with a weak proenvironmental self-identity expressed a higher intention to buy sustainable clothing when they had a high affective attitude and a low cognitive attitude. Conversely, those with a strong proenvironmental self-identity were more likely to intend to buy sustainable clothing if they had a low affective attitude and a high cognitive attitude. This might suggest that women with a strong proenvironmental identity may rely on rational and cognitive processes rather than emotional responses when making sustainable choices. They may prioritise the long-term environmental impact or practical aspects of sustainable clothing, leading to a less direct translation of positive affective evaluations into a stronger inclination towards SCP. This is consistent with value-belief norm theory[27], suggesting that individuals with a strong proenvironmental value system prioritize cognitive considerations, reinforcing their intention to buy sustainable clothing.

In addition, high intention was observed when women with low proenvironmental self-identity had high descriptive norm. Conversely, the influence of descriptive norm decreased with increasing eco-friendly self-identity.

The reduced influence of descriptive norm on the intentions of women with a high proenvironmental self-identity presents an intriguing paradox. While one might expect a stronger environmental commitment to amplify the impact of social norms, our results suggest otherwise. This subgroup showed a lower response to descriptive norm in shaping intentions to purchase sustainable clothing. Theoretically, this can be interpreted as a saturation of normative influence. Women with a strong proenvironmental self-concept may have internalized proenvironmental norms so deeply that external descriptive norms have less impact. Their profound commitment to environmental values likely makes them less reliant on external social cues.

The effect of moral norms on purchase intentions was significant and positive only at the highest levels of proenvironmental self-identity in women. This effect was not observed at the lowest levels of proenvironmental self-identity nor in men. This finding suggests that for women with a strong proenvironmental self-identity, moral norms are a crucial driver of their purchasing decisions. These individuals internalize moral norms more deeply, leading to a heightened sensitivity to ethical considerations when making purchase decisions. For these women, their internalized ethical standards significantly boost their intention to buy sustainable products. This aligns with the value-belief-norm theory, which posits that individuals with strong environmental values are more likely to act in ways consistent with these values, driven by their moral obligations[111]. In contrast, for those with weaker proenvironmental self-identity, moral norms do not exert the same level of influence on their purchase intentions. This could be because these individuals do not internalize these norms as strongly, resulting in a lesser impact on their buying behavior.

The aforementioned patterns did not emerge among male participants. One possible explanation is that men might experience different motivations for sustainable purchasing. Research indicates that men often prioritize economic benefits or technological aspects over social and environmental considerations[132]. Additionally, men may be less likely to view sustainable fashion as an important aspect of their identity, resulting in a weaker interaction between proenvironmental self-identity and descriptive or moral norms[133]. This difference in priorities and self-perception could explain why the same interaction effects are not observed among men.

Explanation of future sustainable clothing purchasing

In terms of future SCP, both affective and cognitive attitude played a role, albeit with different effects. Affective attitude positively influenced behavior, suggesting that consumers who associated positive emotional reactions with purchasing sustainable clothing were more likely to continue this behavior and pursue their environmental goals. Conversely, cognitive attitude had a negative effect, suggesting that those who made rational evaluations about their future purchases tended to reduce their actual purchasing behavior. This implies that emotional reactions have a greater long-term influence on sustainable consumption behavior than rational evaluations. Consumers who associate positive emotions with their sustainable purchases are more likely to maintain this behavior over time, while those who rely on rational considerations may be more inclined to reduce their future purchases.

Interestingly, these observed patterns were found only among men. This suggests that men might be more influenced by immediate emotional responses rather than long-term rational evaluations in sustainable purchasing behavior. Positive emotions associated with sustainable purchases seem to reinforce men's behavior over time, while rational evaluations may lead to a reduction in future purchases as men critically weigh costs and benefits.

Specifically, the interaction effect between self-identity and affective attitude showed that men with low proenvironmental self-identity and high positive affective attitude increased their future SCP. This indicates that positive emotional responses can drive sustainable behavior, especially among those who do not strongly identify with a proenvironmental self-identity.

Additionally, men with low proenvironmental self-identity and low positive cognitive attitude increased their future SCP, suggesting that men may still engage in sustainable consumption even with fewer positive rational evaluations. Conversely, men with high proenvironmental self-identity and high positive cognitive attitude decreased their behaviors, indicating that strong rational evaluations might reduce sustainable purchasing.

In contrast to the findings on consumer intentions (where women who previously purchased sustainable clothing expressed a desire to buy less in the future), past frequent SCP emerged as the strongest predictor of future frequent SCP. This highlights the lasting impact of past sustainable choices on future actions, consistent with the expectation that past behaviors robustly predict future sustainable consumption patterns. However, when environmental identification is low, the influence of past SCP increases, suggesting that women with lower environmental identification increasingly rely on past actions to shape their future sustainable consumption behavior. This indicates that the habitual nature of previous behaviors serves as a more significant guide when self-identification with the environment is low.

The finding that proenvironmental self-identity was not a direct significant predictor of purchase intentions was unexpected and contrasts with some previous studies[127]. This discrepancy may be due to the relatively low average level of proenvironmental self-identity in our sample, which may have weakened the relationship between self-identity and purchase intentions.

The difference between the factors explaining intention and those influencing behavior highlights a significant divergence in the motivations behind these stages of decision-making, supporting the observation that intention does not always predict subsequent SCP. Our study found that self-perception as a green consumer and past SCP play a more crucial role in shaping future behavior than initially expressed intentions, especially among women. These findings suggest that the transition from intention to behavior in SCP is more complex than previously assumed. While prior intentions may not be critical, the influence of identity and past behavior is significant. This is supported by many studies challenging the conventional linear model of the intention-behavior relationship[128] and highlight the need for a more nuanced understanding of the factors that contribute to SCP decisions.

Limitations and future directions

While our study's results are interesting and novel, several limitations must be acknowledged. First, the socio-demographic composition of our sample, predominantly young Italian women, limits the generalizability of our findings. Future research should include a more diverse sample and consider socio-demographic variables as potential moderators to gain deeper insights into SCP across different groups.

Second, the mixed results of previous research on cultural values' influence on sustainability[2] highlight the need to investigate these effects across various cultural contexts. Assessing whether our Italian study's results differ from those in other countries is crucial. Additionally, the self-report nature of our data introduces potential biases, such as social desirability, which may affect the accuracy of reported past and future behaviors.

Third, future research could extend the model by exploring additional types of sustainable purchasing behaviors[130]. The systematic literature review by Schiaroli et al[131]. presents a comprehensive framework of sustainable fashion solutions that encompasses a wide range of behaviors across different phases of consumption. Future studies could apply this framework to examine how these additional behaviors interact with the established ones, potentially refining or expanding the current model. Additionally, future studies should consider anti-consumption, i.e., the deliberate reduction or rejection of consumer goods to minimize environmental impact, to further enhance our understanding of sustainable fashion practices[132].

Fourth, examining additional dimensions of proenvironmental self-identity, like commitment strength, emotional significance of environmental goals, and discrepancies between self-perceived identity and actual behavior, could provide a more comprehensive understanding of how self-identity influences sustainable consumption.

Finally, our inclusion criteria ensured sufficient clothing purchasing behaviors for evaluation but did not specifically target different levels of proenvironmental self-identity. The low mean self-identity score (2.98 on a scale of 1 to 7) in our sample may limit the capture of strong proenvironmental self-identity's impact on SCP. Future research should consider more stringent inclusion criteria or additional screening to ensure higher levels of proenvironmental self-identity among participants.

Despite these limitations, our multilevel analysis accounted for variability and supported our findings' robustness. Examining individuals with lower eco-friendly self-perception provides valuable insights for developing effective interventions. Identifying levers that promote proenvironmental actions among those with weak proenvironmental self-identity can help create targeted strategies to encourage sustainability in a broader audience. Future research should further validate our findings and deepen the understanding of the relationship between self-identity and sustainable consumer behavior.

Theoretical and practical implications

Our findings have several theoretical and practical implications for marketing, policy, and non-governmental measures aimed at promoting the purchase of sustainable clothing, particularly highlighting important gender differences.

Theoretically, the observed discrepancy between the drivers of consumers' intentions and their behavior challenges the traditional linear model that emphasizes intention as the sole predictor of behavior. Researchers should reconsider this traditional emphasis and instead focus on the nuanced interplay of self-identity and past behavior. This shift would allow for a more holistic understanding of the factors influencing sustainable consumption decisions. Our study highlights the importance of distinguishing between affective and cognitive attitudes in predicting SCP intentions and behaviors, especially when considering gender differences and proenvironmental self-identity levels. Importantly, the observed gender differences in the interplay between proenvironmental self-identity and attitudes highlight the need for gender-specific theoretical frameworks incorporating a dual-component approach in measuring the impact of attitudes on intention and behavior related to SCP.

Our results suggest that social norms, especially when internalized as moral norms, strongly predict SCP intentions. This aligns with and extends previous research showing that normative influences are crucial for visible and socially influenced behaviors like clothing purchases[111]. Future theoretical models should incorporate a broader range of normative influences to better capture the social dynamics driving sustainable behaviors. The multigroup analysis revealed gender-specific findings. While moral norms were strong predictors of SCP intention for both men and women, their significance persisted only for women when proenvironmental self-identity was included. This indicates that moral norms influence women's SCP intentions, particularly when their proenvironmental self-identity is high. For men, none of the predictors of SCP intentions were significant when moderated by proenvironmental self-identity. However, for women, moral norms, affective and cognitive attitudes, and descriptive norms were significant predictors. Proenvironmental self-identity moderated these effects by reducing the impact of affective attitude and reinforcing the effects of both cognitive attitude and descriptive norm on SCP intention. These findings highlight the need for gender-specific theoretical frameworks that incorporate a dual-component approach to measuring the impact of attitudes and social norms on SCP intentions and behaviors.

The reason proenvironmental self-identity seems to affect only women's intentions might be explained by existing research[132,133]. These findings imply that theoretical models of sustainable consumption need to account for gender-specific pathways. Understanding why women's sustainable purchasing intentions are more closely tied to their proenvironmental self-identity can help refine these models.

Furthermore, our study introduces the concepts of compensatory and self-licensing behaviors to explain the observed negative relationship between past SCP and future intentions[117-120]. This theoretical integration offers a novel explanation for why individuals who have practised SCP in the past show a lower intention to continue these behaviors. These finding challenges traditional TPB assumptions and calls for the inclusion of compensatory mechanisms in future models to better predict sustainable consumption patterns.

Finally, by using a multilevel modeling approach, we accounted for the hierarchical nature of the data and within-person variability in SCP. This methodological advance provides a robust framework for analyzing complex behaviors and can be applied to other areas of environmental psychology. It underscores the importance of considering individual-level factors and their interactions with broader social influences in predicting sustainable behaviors. Future research should test this model of multiple behaviors in different cultural contexts to explore the impact of cultural values on sustainable clothing choices. Adapting strategies to specific cultural values can enhance the effectiveness of global initiatives and contribute to more targeted and culturally sensitive approaches to promoting sustainable behaviors.

Regarding managerial implications, the positive influence of affective attitude on SCP suggests that marketing should focus on building emotional connections with consumers. Strategies that evoke positive emotions related to environmental goals could foster long-term engagement and consistent sustainable consumption behavior. Secondly, the significant influence of previous sustainable clothing behavior on future actions highlights the importance of recognizing and building on people's past choices. Practitioners should leverage positive experiences consumers have had with sustainable fashion to encourage ongoing and consistent behavior. However, they should also consider individual differences in self-identity when targeting women, recognizing that those with higher environmental identities rely less on past behaviors in their future decisions.

The results of our study offer several policy implications for promoting SCP, tailored to the specificities of women and men as consumers. Educational campaigns should address both the emotional and rational aspects of SCP. Emphasizing the personal satisfaction and environmental benefits of sustainable consumption, such as its positive impact on the environment and personal well-being, alongside logical arguments for resource conservation and waste prevention, can resonate more with consumers and motivate behavior change. This dual approach is particularly important for men, who appear to be less sensitive to proenvironmental principles. Secondly, leveraging social norms can increase the effectiveness of these campaigns. By publicizing the sustainable behaviors of influential figures and community leaders, campaigns can create a positive social environment that encourages both women and men to adopt similar practices and feel less stigmatized. When sustainable practices are more visible and socially desirable, the impact of social norms can be amplified, promoting a culture of sustainability. Thirdly, increasing proenvironmental self-identity is crucial. Campaigns should support activities and programs that help individuals build and strengthen their environmental identity. Engaging consumers in sustainability workshops, green community projects, and sustainability pledges can reinforce their commitment to SCP and integrate sustainable behaviors into their core identity. Finally, educational campaigns should address compensatory and self-licensing behaviors. Informational content can help consumers recognize and avoid these behaviors. Encouraging consistent and ongoing commitment to sustainable practices through reward systems that recognize continuous sustainable behavior over time can also mitigate the impact of compensatory behaviors.

Conclusion

In summary, our study tested a multi-behavioral model to understand consumers' intentions and purchasing behavior regarding sustainable clothing. We incorporated TPB variables, moral norms, past behaviors, and proenvironmental identity to examine their influence on eco-friendly, second-hand, and quality clothing purchases. Key findings challenge the conventional focus on individual beliefs (attitude and perceived behavioral control) in sustainable consumption. Social and internalized norms (moral norms) were notably influential. Individuals with weak proenvironmental self-identity were influenced by strong affective attitudes, low cognitive attitudes, and less frequent past SCP for intentions, but more frequent past SCP for future behavior. Strong proenvironmental self-identity reduced the influence of descriptive norms and intention when perceived behavioral control was low. The emerged discrepancy between the predictors of intention and behavior highlights the complexity of SCP decision-making, suggesting that self-identity and past behaviors are more critical than

prior intentions. Gender differences were significant: proenvironmental self-identity affected the relationship between past and future SCP in women and between attitudes and future SCP in men. Practically, marketing should focus on building emotional connections, leveraging positive past experiences, and acknowledging gender-specific dynamics. Policymakers and industry stakeholders should develop tailored strategies to promote sustainable apparel choices, considering the complex interplay between intentions and behaviors.

Data availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

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Author contributions

V.C. and P.C. designed the study and managed data collection V.C., G.B., P.C. wrote the main manuscript text G.B. analyzed data, reported findings and prepared figures.

Declarations

Competing interests

The authors declare no competing interests.

Additional information

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