

RESEARCH ARTICLE

The green mate appeal: Men's pro-environmental consumption is an honest signal of commitment to their partner

Sylvie Borau  | Leila Elgaaied-Gambier | Camilla BarbarossaMarketing Department, TBS Business School,
Toulouse, France**Correspondence**Sylvie Borau, TBS Business School, 20
Boulevard Lascrosses, 31068 Toulouse,
France.

Email: s.borau@tbs-education.fr

Abstract

Green consumption is associated with femininity. This green-feminine stereotype has been accused of deterring men from buying green products to protect their gender identity. Here, we investigate whether men can benefit from this green-feminine stereotype, beyond the status effect of green conspicuous consumption. We propose that green consumption can act as a signal of altruism and high commitment both as a partner and as a father. Based on evidence showing that these traits are sought in a long-term partner, we predict that men can increase their value as long-term mates by engaging in green consumption. We also investigate whether men involved in a long-term mating relationship are indeed eco-friendlier, testing the novel hypothesis that green consumption is an honest signal of commitment. Finally, we specify the type of commitment that is associated with men's green consumption. Across six studies, our findings suggest that green consumption is an honest signal of men's long-term mating value and that it is a more reliable sign of partner commitment than of father commitment. We discuss how companies and governments can use these findings to increase green consumption among men.

KEYWORDS

green marketing, mating value, pro-environmental consumption, sexual selection, signaling

1 | INTRODUCTION

Recent academic studies have suggested that men might be tempted to avoid eco-friendly products to protect their masculine identity (Brough, Wilkie, Ma, Isaac, & Gal, 2016; Swim, Gillis, & Hamaty, 2019). These studies were widely covered by the press (e.g., The Guardian, The NY Post, Newsweek, and NBC News), sometimes oversimplifying the research findings with catchy headlines, such as "men avoid reusable shopping bags to not look gay" (New York Post, 2019). The special interest of mainstream media on this topic is not surprising. If half the adult population (i.e., male consumers) is likely to turn down sustainable consumption at some point, this could have great implications not only for companies promoting eco-friendly products but also for the whole society.

The existence of the gender gap is now well-documented in the literature on pro-environmental behaviors (and pro-environmental consumption in particular). Women appear to have stronger attitudes

towards environmental preservation and a higher likelihood to adopt eco-friendly consumption behaviors than men (Davidson & Freudenburg, 1996; Hunter, Hatch, & Johnson, 2004; Xiao & McCright, 2015; Zelezny, Chua, & Aldrich, 2000). On the other hand, men seem to show some reluctance to engage in eco-friendly consumption and ethical consumption in general because it would be associated with femininity (Brough et al., 2016; Pinna, 2019; Shang & Pelozo, 2016; Swim et al., 2019), and this green-feminine stereotype could constitute a threat to their masculine identity. But does this stereotype always pose a threat to men? Elle, the famous women's magazine, also covered these same academic findings on the green-feminine stereotype but from a totally different angle: the magazine published photos of "18 Hot Guys Who Remembered a Reusable Bag" on its website, arguing with humor that "research says it's seen as 'unmanly' to go green. Research is wrong" (Elle, 2019). In fact, feminine attributes are not solely a source of handicap for men. From a sexual selection perspective, feminine features sometimes

constitute an asset for men. When choosing a long-term partner, women tend to exhibit a stronger preference for caring men who provide cues of willingness to invest their resources in their offspring and their partner (Bhagal, Galbraith, & Manktelow, 2019; Buss, 2016; Buss & Schmitt, 2019; Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004). These good partner communal qualities (e.g., warmth, trustworthiness, altruism, helpfulness) tend to be associated with femininity (Basow, 1986; Spence & Helmreich, 1978) and tend to be selected by women when choosing a long-term mate.

In this paper, we argue that men could be motivated to buy eco-friendly products to signal their altruism to increase their mating value because of women's preference for altruism in long-term mates. That is, men could engage in eco-friendly consumption as a costly signal of their altruism to conform to women's preferences. Eco-friendly consumption is considered a costly signal because it requires the adopters to incur higher sacrifices in terms of money (e.g., eco-friendly products might be more expensive than their conventional alternatives), time (e.g., taking public transportation can be more time consuming than driving one's own car), and cognitive resources (e.g., eco-labels can be difficult to understand). Because eco-friendly consumption is costly and thus difficult to fake, it can be considered an honest signal of altruism and cooperation (Farrelly, 2011; Farrelly, Lazarus, & Roberts, 2007). And because altruism and cooperation are qualities that are valued in a long-term partner, eco-friendly consumption could be an honest signal of partner commitment. In other words, men's adoption of eco-friendly products may signal their current or future commitment as a partner and father. One study reported that people assign a higher long-term mating value to owners of green products than to owners of luxury products (DiDonato & Jakubiak, 2016). This result seems to be in line with our narrative, but the effect found in this specific study could have been driven by the lowest ratings generally attributed to the long-term mating value of owners of luxury products (Sundie et al., 2011). Furthermore, neither the honesty of the signal of commitment sent by male green consumption nor the exact type of commitment conveyed by this signal has yet been examined.

Assuming that this signal is honest, men who are involved in a committed relationship should engage in eco-friendly consumption. In addition, if men's signaling strategy is in line with women's preferences, single men who are looking for a long-term relationship should also signal eco-friendliness. Do men adapt their green consumption depending on their commitment and mating aspirations? Are men more likely to adopt green consumption when they want to settle down in a long-term relationship? What type of commitment does men's green consumption signal?

The objective of this research is to answer these critical questions to gain a richer understanding of men's eco-friendly consumption. Across six studies, we will refine the previous findings related to the green-feminine stereotype by exploring the potential benefits that men might derive from signaling their eco-friendliness. First, we replicate previous findings regarding the inferences and perceived desirability of male eco-friendly consumers in a more controlled setting; then, we extend these findings by examining men's likelihood

of engaging in eco-friendly consumption based on their parental status and relationship commitment.

Altogether, these studies advance our understanding of male green consumption by unraveling the benefits that men could reap on the mating market when signaling their eco-friendliness and by investigating the honesty and the true nature of this signal. The results of this research have tremendous implications for companies and governments which seek to find new levers to increase men's eco-friendly consumption.

2 | CONCEPTUAL BACKGROUND

Products can be used by consumers to signal information to others (Hennighausen, Hudders, Lange, & Fink, 2016; Wang & Griskevicius, 2014). Recently, it has been shown that green products and green consumption in general signal femininity and that this green-feminine association could deter men from buying green products. In this section, we review the green-feminine stereotype, and we argue that this signal of femininity sent by green consumption is not systematically negative for men. More specifically, we argue that men can benefit from this feminine signal in terms of long-term mating value, because women tend to appreciate and look for feminine qualities (e.g., altruism, cooperation) in a long-term mate. Because signals appear and evolve in one sex to meet the mating preferences of the opposite sex (Stewart-Williams & Thomas, 2013), we argue that men can actually increase their long-term mating value with the opposite sex by signaling these feminine qualities sought in a partner. Consequently, we argue that men can strategically adopt green consumption to send this signal of femininity (as a byproduct of the signals of altruism and cooperation) to the opposite sex, and we further discuss the honesty and the true nature of this signal.

2.1 | Green consumption as a signal of femininity

Consumer products and consumption choices have been described as signs of the self that help individuals manage their identity (Belk, 1988; Holt & Thompson, 2004; Rochberg-Halton, 1984). Consumer choices can play a self-signaling role when they help consumers define their individual sense of self (Rucker & Galinsky, 2008; Sedikides, Gregg, Cisek, & Hart, 2007), but they also signal to others "*who we are, where we have come from, and perhaps where we are going*" (Belk, 1988, p.189; Douglas & Isherwood, 1979). Consumer products thus trigger inferences about their owners, and owners can adopt certain products to communicate about their self—or their future self—to others (Belk, 1988; Berger & Heath, 2007; Berger & Ward, 2010; Dubois, Rucker, & Galinsky, 2012; Puska, Kurki, Lähdesmäki, Siltaoja, & Luomala, 2016). A growing body of literature on consumer behavior uses signaling theory to better understand consumer choices (e.g., Griskevicius, Tybur, & Van den Bergh, 2010; Hennighausen & Schwab, 2014, Hudders, De Backer, Fisher, & Vyncke, 2014; Miller, 2009; Saad, 2007; Saad & Vongas, 2009; Wang & Griskevicius, 2014). This view sheds light on the utility of

different types of consumer goods (e.g., green products, smartphones or cosmetics). For example, green products (e.g., electric cars) can help consumers communicate their status (Burgess, King, Harris, & Lewis, 2013; Griskevicius et al., 2010). Green products can also convey owners' gender identity (Brough et al., 2016).

More specifically, green products can signal femininity (Brough et al., 2016). It has already been shown that gendered products can signal a certain level of masculinity or femininity (Borau & Bonnefon, 2019; Cunningham & Macrae, 2011; Tilburg, Lieven, Herrmann, & Townsend, 2015), just as people and brands can communicate gender (Grohmann, 2009; Neale, Robbie, & Martin, 2016). Green products can then be considered gendered products that lean towards femininity on the gender continuum. Because people infer feminine personality traits about the owners of feminine products and because green products and femininity are cognitively linked, a green product can trigger feminine inferences about the gender identity of its owner, also known in the scientific literature as the "green-feminine stereotype." This green-feminine stereotype is the direct consequence of the feminine signal sent by green products. This feminine signal can have negative and positive impacts on men's mating desirability.

2.2 | The negative impact of the feminine signal sent by green consumption on men's gender identity and mating desirability

Some argue that this green-feminine stereotype could deter men from buying green products to protect their gender identity. Indeed, consumers sometimes choose products by copying a reference group, but they can also reject products by avoiding a dissociative group to maintain their identity (e.g., Bearden & Etzel, 1982; Gill & Lei, 2018; White & Dahl, 2006).

Men seem to be particularly resistant to purchase products that signal femininity to maintain their gender identity (Antonetti & Maklan, 2016; Avery, 2012; Brough et al., 2016; Gal & Wilkie, 2010; Gill & Lei, 2018; Morris & Cundiff, 1971; Pinna, 2019; White & Dahl, 2006). For example, Shang and Peloza (2016) showed that consumption of ethical alternatives communicates higher femininity to external observers, which could be threatening for male consumers. Similarly, Brough et al. (2016) showed that green products can trigger repulsion among male consumers for the fear of being perceived as overly stereotypically feminine and to preserve their macho image. In sum, prior research suggests that ethical and green products are associated with femininity, that this association can threaten male consumers' identity and that this psychological risk could create a barrier to the adoption of green products.

Men's willingness to preserve their masculine identity at all costs can be explained, at least partially, by women's preferences for masculine men. Research has shown that women, on average, tend to prefer men who possess masculine traits, such as dominance, aggressivity, and power (e.g., Ahmetoglu & Swami, 2012; Sadalla, Kenrick, & Vershure, 1987). These traits are indeed an indicator of men's capacity to provide greater physical protection to their partner and to aggressively compete for resources. While green products

communicate altruism and warmth, they do not communicate dominance, aggressivity, and power. As a result, green products signal femininity but do not signal manhood and, as such, green products could be detrimental to men's mating value. Thus, in addition to protecting their gender identity (Brough et al., 2016), male consumers could also be sensitive to an opportunity cost, that of increasing their mating desirability by buying the gender-typical version of a product (Borau & Bonnefon, 2019), even if this product is not eco-friendly. This could explain why heterosexual men are reluctant to buy green products that have opposite gender connotations. In other words, people can make inferences about the mating qualities of owners of green products based on the inferences they make about their gender identity, and these could create barriers to the purchasing of green products by men. That being said, owning green products might not always be detrimental to men's mating value when considering a long-term relationship, as we now discuss in the following section.

2.3 | The positive impact of the feminine signal sent by green consumption on men's long-term mating desirability

Qualities that are preferred in a mate tend to vary depending on the context (Snyder, Kirkpatrick, & Barrett, 2008). Some masculine traits that can be perceived as attractive for a short-term relationship—such as dominance and aggressivity—can be repulsive for a long-term relationship because they are not indicators of parent competence and partner loyalty (Perrett et al., 1998). In fact, exaggerated masculinity is not especially attractive to (heterosexual) women. Indeed, men who are perceived as cooperative, warm, and altruistic are considered to be more desirable romantic partners (Bhagal, Farrelly, & Galbraith, 2019; Van Vugt & Iredale, 2013), because these qualities signal commitment both as a partner and as a parent, and commitment has been consistently linked to increased offspring survival and future reproduction (Geary, 2015). This might explain why men, especially when they are single, tend to adopt altruistic behaviors as a signaling strategy. For example, previous research found that the presence of a woman in a social group increases the amount of money that single men contribute to a public good (Balliet, Li, Macfarlan, & Van Vugt, 2011; Tognetti, Dubois, Faurie, & Willinger, 2016; Van Vugt & Iredale, 2013) and that men who are happily committed in a relationship also tend to be more cooperative and altruistic (Tallman & Hsiao, 2004). In other words, while signaling a strong level of femininity might be detrimental to men's short-term mating value, signaling warmth, cooperation, and altruism might actually be beneficial to men's long-term mating value, as these qualities are generally sought in a long-term partner (Arnocky et al., 2017). As a result, green products could increase men's long-term mating value because they signal feminine traits, such as cooperation, warmth, and altruism (Antonetti & Maklan, 2016), which are considered desirable traits in a potential long-term partner.

The results of a recent research seem to validate this hypothesis (DiDonato & Jakubiak, 2016). In this research, the authors showed that both men and women evaluated owners of eco-friendly products

as more attractive long-term partners than owners of luxury products. While this research is the first to hypothesize and show a potential link between green consumption behavior and mating value, the theoretical and empirical data of this research suffer from some limitations. First, the authors compared the mating value of owners of green products versus luxury products. It has been shown though that owners of luxury products are perceived as better partners for short-term relationships but not for long-term relationships. For example, Sundie et al (2011) showed that men with fancy cars were perceived as uncommitted partners. Thus, it is possible that respondents just rated the long-term mating value of owners of luxury products as less desirable and not the long-term mating value of owners of green products as more desirable. Second, the authors did not investigate the type of commitment conveyed by men who engage in eco-friendly consumption (i.e., father commitment or partner commitment). Third, they did not examine the reliability of this signal of commitment, that is, whether men who engage in eco-friendly consumption are indeed more likely to be engaged in a long-term relationship.

In sum, signaling femininity (as a byproduct of signaling altruism and warmth through the act of purchasing green products) could be beneficial to men's long-term mating value. The signaling should convey some information about a man's tendency to behave cooperatively and kindly as a partner, which may reflect a general orientation towards long-term mating. This result should be replicated though by contrasting green products with regular products and not luxury products. In addition, whether this behavior signals that green consumers are committed partners and committed fathers have not yet been investigated and neither has the honesty of this signal.

2.4 | The honesty of the signal of eco-friendliness as men's long-term commitment and the true nature of this commitment

Costly signals are difficult to fake, they must provide a fitness benefit to their signaler and they are supposed to be an honest cue of an unobservable quality of an individual (Dunham, 2011). Eco-friendly products can be interpreted as costly signals (Griskevicius et al., 2010) because (a) they are difficult to fake (Puska et al., 2016); (b) they could give men benefits on the mating market (DiDonato & Jakubiak, 2016); and because (c) they provide honest cues about an individual's level of altruism and commitment—qualities that are not directly observable. However, are they actually an honest signal? If green consumption were an honest signal of men's relationship commitment, men who are engaged in a long-term relationship should consume more eco-friendly products, and men who wish to commit to a long-term relationship should be playing a signaling game, communicating their eco-friendliness. To the best of our knowledge, these predictions have not yet been investigated.

Furthermore, the type of commitment that is signaled and/or truly associated with a man's green consumption has not been specified. Men's commitment can encompass both partner commitment (i.e., willingness to share resources with the opposite-sex partner) and father commitment (i.e., engaging in co-parenting by

investing time and resources in their offspring). Considering that parenting motivations lead men to be more future-focused (Li, Haws, & Griskevicius, 2018), one would expect fathers to be more concerned about the future of our planet and consequently to adopt more eco-friendly consumption behaviors. Involved fathers should be even more likely to adopt eco-friendly consumption behaviors, as previous research highlights the relationship between father involvement and cooperation with partners (Henley & Pasley, 2005; Waller, 2012). We argue that there might be a link between father involvement and cooperative behaviors that are not just partner-oriented but also prosocial or altruistic in general. As a result, women should perceive eco-friendly men not only as more committed partners but also as more committed fathers. This research seeks to determine whether a man's eco-friendliness signals partner commitment, father commitment or both, and most importantly, it investigates whether this signal of commitment is an honest signal.

Synthesizing the literature, we expect men who engage in eco-friendly consumption to be perceived as more feminine, more altruistic, more committed fathers and partners than men who do not engage in eco-friendly consumption. We also expect these men to be perceived as more desirable long-term partners but not short-term partners. In turn, we expect men to engage more in eco-friendly consumption when they are involved fathers and/or involved in a committed relationship or when they are aspiring to be committed to a long-term relationship.

3 | OVERVIEW OF STUDIES

We tested our predictions with six studies (Table 1). Study 1 tests whether male green consumers are perceived as more feminine and altruistic and whether they are perceived as being better dads and partners for a long-term relationship. Study 2 investigates whether male green consumers are perceived by women as desirable partners for long-term and short-term relationships. Three additional studies explore whether fathers (Study 3), committed fathers (Study 4a), and committed partners (Study 4b) are perceived by women as eco-friendlier than childless men, noncommitted fathers, and noncommitted partners. Finally, Study 5 verifies whether fathers, committed fathers, committed partners, and men who wish to engage in a long-term relationship are indeed eco-friendlier.

All studies recruited participants in the USA through online panels (Research Now or Prolific), and all analyses were conducted in R (R Core Team, 2015).

4 | STUDY 1

The purpose of Study 1 was to test whether people made inferences about male owners of green products. More specifically, we investigated whether the imaginary owner of green products was

TABLE 1 Overview of the empirical research

Objectives	Variables	Design, material, and Sample	Predictions
Study 1 tests whether the imaginary owner of green products is perceived as feminine, altruistic, a committed dad, and a committed partner for a long-term relationship.	Manipulation: products' eco-friendliness Variables: man's eco-friendliness, femininity (and masculinity), altruism, commitment as a father and as a partner.	Research design: between-subject experiment. Stimuli: pictures of green versus non-green products (Brough et al., 2016). Respondents: men and women (N = 362)	Imaginary owners of green products are perceived as more feminine, altruistic, committed fathers, and committed partners for a long-term relationship (than imaginary owners of regular products).
Study 2 replicates Study 1 among women only and investigates further whether men owning green products are perceived by women as desirable partners for short-term and long-term relationships.	Manipulation: products' eco-friendliness Variables: man's eco-friendliness, femininity (and masculinity), altruism, commitment as a father and as a partner, desirability as short-term and long-term partner.	Research design: between-subject experiment. Stimuli: pictures of green versus non-green products (Brough et al., 2016). Respondents: women (N = 195)	Imaginary owners of green products (vs. regular products) are perceived by women as more desirable as long-term mates, but not as short-term mates.
Study 3 explores whether fathers are perceived by women as eco-friendlier than childless men.	Manipulation: paternity Variables: man's eco-friendliness, femininity (and masculinity), altruism, commitment as a father and as a partner.	Research design: between-subject experiment. Stimuli: pictures of dad versus childless man Respondents: women (N = 194)	Men who have children are perceived by women as eco-friendlier than childless men.
Studies 4a and 4b explore whether committed fathers (Study 4a), and committed partners (Study 4b) are perceived by women as eco-friendlier than childless men, noncommitted fathers, and noncommitted partners	Manipulations: level of parental commitment (Study 4a) Level of romantic commitment (Study 4b) Variables: man's eco-friendliness, femininity (and masculinity), altruism, commitment as a father and as a partner.	Research design: between-subject experiment. Stimuli: vignettes of committed (vs. uncommitted) fathers (Study 4a) Vignettes of committed (vs. uncommitted) partners (Study 4b) Respondents: women (Study 4a: N = 191; Study 4b: N = 195)	Committed fathers (Study 4a) and committed partners (Study 4b) are both perceived by women as eco-friendlier than noncommitted fathers and partners.
Study 5 verifies whether fathers, committed fathers, committed partners, and men who wish to engage in a long-term relationship are indeed eco-friendlier.	Variables: green consumption orientation (self-reported green behaviors and perceived green self-identity), parental status, commitment as a father (self-reported behaviors and perceived parenting skills), relationship status, commitment as a partner.	Research design: survey Respondents: Men (N = 470)	Men engage more in eco-friendly consumption when they: (a) are committed fathers, (b) are committed in a long-term relationship, (c) aspire to commit to a long-term relationship.

perceived as feminine, altruistic, a committed dad, and a committed partner for a long-term relationship.

4.1 | Method

The sample consisted of 362 individuals ($M_{\text{age}} = 46$, standard deviation [SD] = 17, min = 18, max = 75, 177 men) recruited in the USA through an online panel (Research Now). We conducted an experiment with two different conditions: participants were randomly exposed to either a visual showing a set of ten green products (N = 183, 78 men) or a visual

showing a set of ten non-green products (N = 179, 99 men). These visuals were utilized by Brough et al. (2016) in a very similar setting¹. Participants were asked to look attentively at the set of products and to imagine their male owner.

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Then, participants were asked to make inferences about the various characteristics of the owner. These inferences belonged to five domains: eco-friendliness (three items, e.g., *A consumer caring about the natural environment*), masculinity and femininity (three items for each dimension, e.g., *Masculine*), altruism (five items, e.g., *Helps others*), commitment as a dad (eight items, e.g., *Is involved in the education of his children*), and commitment as a long-term partner (five items, e.g., *Is involved in a long-term relationship*).

Respondents' perceived green self-identity and sociodemographic information were assessed at the end of the protocol. Perceived green self-identity was measured with three items (e.g., *I think of myself as a consumer caring about the natural environment*). Respondents also indicated their age, parental status (with or without children), and relationship status (single or in a relationship). Appendix 1 lists all the items, with descriptive statistics and Cronbach's α scores for the scales.

4.2 | Results

Figure 1 displays the distribution of scores assigned to the imaginary male owners of green versus non-green products in the five domains of eco-friendliness, masculinity and femininity, altruism, commitment as a dad, and commitment as a partner in a long-term relationship. Figure 1 suggests that participants' inferences about male owners were strongly affected by the products they owned: male owners of green products were perceived as more eco-friendly, more feminine, more altruistic, and more committed both as a dad and as a long-term partner. However, they were not perceived as less masculine.

These findings are consistent with the results of linear regressions assessing the inferences that participants made about the imaginary male consumer as a function of the products he owned, with age, parental status, dating status, and perceived green self-identity as control variables. These analyses are summarized in Table 2. They confirm that the imaginary male owner of green products receives

higher scores on the five measures: eco-friendliness ($t(355) = 13.958$; $p < .001$), femininity ($t(355) = 4.133$; $p < .001$), altruism ($t(355) = 6.341$; $p < .001$), commitment as a dad ($t(355) = 3.640$; $p < .001$), and commitment as a long-term partner ($t(355) = 2.425$; $p = .015$). Note that owners of green products were not perceived as being significantly less masculine ($t(355) = -0.025$; $p = .980$).

4.3 | Discussion

As expected, participants inferred that men owning green products are eco-friendlier, more altruistic, but also better dads and partners, than men owning non green products. In other words, green consumption signals a man's green identity (e.g., he highly cares about the environment), altruism (e.g., he is more willing to help others and is less selfish), and mate value (e.g., he is a good partner and dad). These findings complement previous research that shows that men who engage in environmental conservation or purchase green alternatives tend to be perceived as altruistic and self-sacrificing (Didonato & Jakubiak, 2016; Griskevicius, Tybur, & Van den Bergh, 2010).

Study 1 also shows that men who own green products are perceived by both male and female respondents as more feminine than men who own non-green products. Brough et al. (2016) had already demonstrated that green consumption behaviors are cognitively associated with femininity. Our results tend to confirm the existence of this green-feminine stereotype. Nevertheless, it is worth noting that our data highlight no cognitive association between greenness and lower perceived masculinity. Shang and Peloza (2016) found that ethical consumption is associated with perceptions of higher femininity and lower masculinity, thus suggesting that masculinity and femininity are mutually exclusive. On the other hand, Brough et al. (2016) found different paths for masculinity and femininity, supporting the idea that these constructs are independent rather than polar ends of a single continuum. The results of Study 1 are consistent with the latter findings.

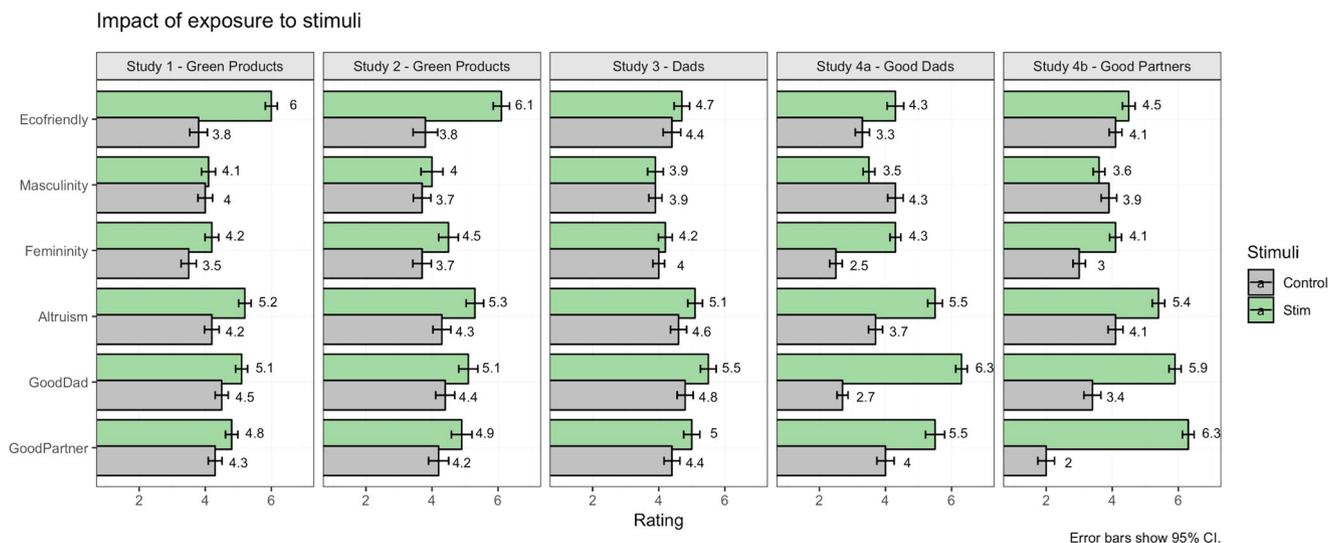


FIGURE 1 Inferences made by respondents in Studies 1–4b (means and standard errors) [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 2 Regression results, Study 1; perceived eco-friendliness, masculinity, femininity, altruism, commitment as a dad and as a partner depending on the products owned by the imaginary man (green vs. conventional)—with age, parental status (having children or not), relationship status (single or not), sex (men or women), and perceived green self-identity as covariates

	Dependent variable					
	EcoFriendliness (1)	Masculinity (2)	Femininity (3)	Altruism (4)	GoodDad (5)	GoodPartner (6)
Stim green prod	1.11*** (0.08)	-0.002 (0.10)	0.39*** (0.09)	0.57*** (0.09)	0.33*** (0.09)	0.22* (0.09)
Age	-0.03 (0.04)	-0.07 (0.05)	-0.25*** (0.05)	-0.09 (0.05)	-0.12* (0.05)	-0.19*** (0.05)
Children	0.03 (0.09)	0.25* (0.11)	0.10 (0.11)	0.10 (0.10)	0.17 (0.10)	0.21* (0.11)
Status single	0.02 (0.10)	0.01 (0.12)	-0.09 (0.12)	0.05 (0.11)	0.002 (0.11)	0.02 (0.11)
Sex women	-0.17* (0.08)	-0.31** (0.10)	-0.25** (0.09)	-0.01 (0.09)	0.02 (0.09)	-0.14 (0.09)
Green self id	0.23*** (0.03)	0.27*** (0.03)	0.22*** (0.03)	0.28*** (0.03)	0.31*** (0.03)	0.30*** (0.03)
Constant	-1.59*** (0.15)	-1.28*** (0.19)	-1.18*** (0.18)	-1.72*** (0.18)	-1.80*** (0.18)	-1.61*** (0.18)
Observations	362	362	362	362	362	362

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 3 Regression results, Study 2

	Dependent variable					
	EcoFriendliness (1)	Masculinity (2)	Femininity (3)	Altruism (4)	GoodDad (5)	GoodPartner (6)
Stim green prod	1.14*** (0.11)	0.07 (0.13)	0.35* (0.13)	0.60*** (0.13)	0.33* (0.13)	0.26* (0.13)
Age	-0.10 (0.06)	-0.10 (0.07)	-0.24** (0.07)	-0.15* (0.07)	-0.11 (0.07)	-0.12 (0.07)
Children	0.16 (0.12)	0.33* (0.15)	0.18 (0.15)	0.32* (0.14)	0.08 (0.14)	0.04 (0.14)
Status single	0.09 (0.13)	-0.31 (0.16)	-0.29 (0.16)	-0.27 (0.15)	-0.57*** (0.15)	-0.57*** (0.16)
Green self id	0.22*** (0.04)	0.22*** (0.05)	0.17*** (0.05)	0.21*** (0.05)	0.22*** (0.05)	0.22*** (0.05)
Constant	-1.78*** (0.22)	-1.22*** (0.27)	-1.06*** (0.27)	-1.47*** (0.26)	-1.16*** (0.26)	-1.11*** (0.27)
Observations	195	195	195	195	195	195

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

To conclude, this first study enabled us to replicate and further clarify the inferences made about eco-friendly consumers. However, the study does not provide any indication of the (un)desirability of these inferences on the mating market. Study 2 addresses this issue.

5 | STUDY 2

The purpose of Study 2 is to replicate Study 1 but among women only and to extend our findings to the desirability of male owners of green products both as short-term and long-term partners.

5.1 | Method

After filtering out seven participants who had an exclusive preference for dating women (because the experimental protocol assumed a preference for dating opposite-sex individuals), the sample consisted of 195 women (mean age = 40, $SD = 16$, min = 18, max = 75). Again, we conducted an experiment with two different conditions. We adopted the same design and the same visuals as in Study 1. Respondents were randomly exposed to either the visual showing a set of ten green products ($N = 98$) or the visual showing a set of ten non-green products ($N = 97$). We utilized the same measures as in Study 1. However, before rating the perceived eco-friendliness, masculinity and femininity, altruism, commitment as a father, and commitment as a long-term partner of the imaginary owner of these products, participants first rated the level of desirability of this imaginary man as a long-term mate and as a short-term mate. Appendix 2 lists all the items, with descriptive statistics and Cronbach's α scores for the scales.

5.2 | Results

As shown in Figure 1 and confirmed in Table 3, the results of Study 2 are in line with the results found in Study 1. More specifically, the results of linear regressions with the same covariates as in Study 1 show that women imagined male owners of green products as more eco-friendly ($t(189) = 10.385$; $p < .001$), more feminine ($t(189) = 2.591$; $p = .01$), more altruistic ($t(189) = 4.745$; $p < .001$), and more committed both as fathers ($t(189) = 2.594$; $p = .01$) and as long-term partners ($t(189) = 2.006$; $p = .04$) than men owning non-green products. Again, male owners of green products were not perceived as less masculine ($t(189) = 0.553$; $p = .581$).

We then examined the perceived desirability of male owners of green versus non-green products as short-term and long-term mates (Table 4 and Figure 2). We ran two regression models with desirability as a long-term mate and desirability as a short-term mate as the dependent variables, respectively; stimuli (green products vs. non-green products), respondent's dating status (single vs. in couple) and their interaction as predictors; and age, parental status, and perceived green self-identity as control variables. We did not detect a main effect of the stimuli on desirability as a long-term mate ($t(188) = -0.73$; $p = .47$) or as a short-term mate ($t(188) = -1.07$;

$p = .29$). However, we did find an interaction effect of the stimuli with the respondent's dating status on desirability as a long-term mate ($t(188) = 2.33$, $p = .02$) but not as a short-term mate ($t(188) = 1.7$; $p = .09$). More specifically, single women indicated that men owning green products were more desirable as long-term mates than men owning non-green products ($M_{\text{GreenSingle}} = 3.9$, $M_{\text{Non-greenSingle}} = 3.4$; $t(146) = 2.227$; $p = .03$); however, they did not indicate that men owning green products were more desirable as short-term mates.

5.3 | Discussion

Study 2 assessed the traits that women ascribe to male green consumers and how these perceptions translate into women's interest in mating with these men. The results of this second study replicated Study 1's findings, but among women only. Once again, we found green consumption to be associated with higher femininity but not with lower masculinity, suggesting the stability of this effect. The results of Study 2 also revealed that single women perceived men owning green products (vs. non-green products) as more desirable as long-term mates but not as short-term mates.

TABLE 4 Regression results, Study 2

	Dependent variable: perceived desirability as	
	Long-term mate (1)	Short-term mate (2)
Stim green prod	-0.11 (0.16)	-0.16 (0.15)
Status single	-0.57** (0.21)	-0.42* (0.21)
Children	0.19 (0.15)	0.25 (0.15)
Age	-0.16* (0.07)	-0.22** (0.07)
Green self id	0.18*** (0.05)	0.22*** (0.05)
Stim green X status single	0.75* (0.32)	0.54 (0.32)
Constant	-0.87** (0.28)	-1.10*** (0.28)
Observations	195	195
R^2	0.15	0.18
Adjusted R^2	0.12	0.15
Residual standard error (df = 188)	0.94	0.92
F statistic (df = 6; 188)	5.47***	6.69***

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

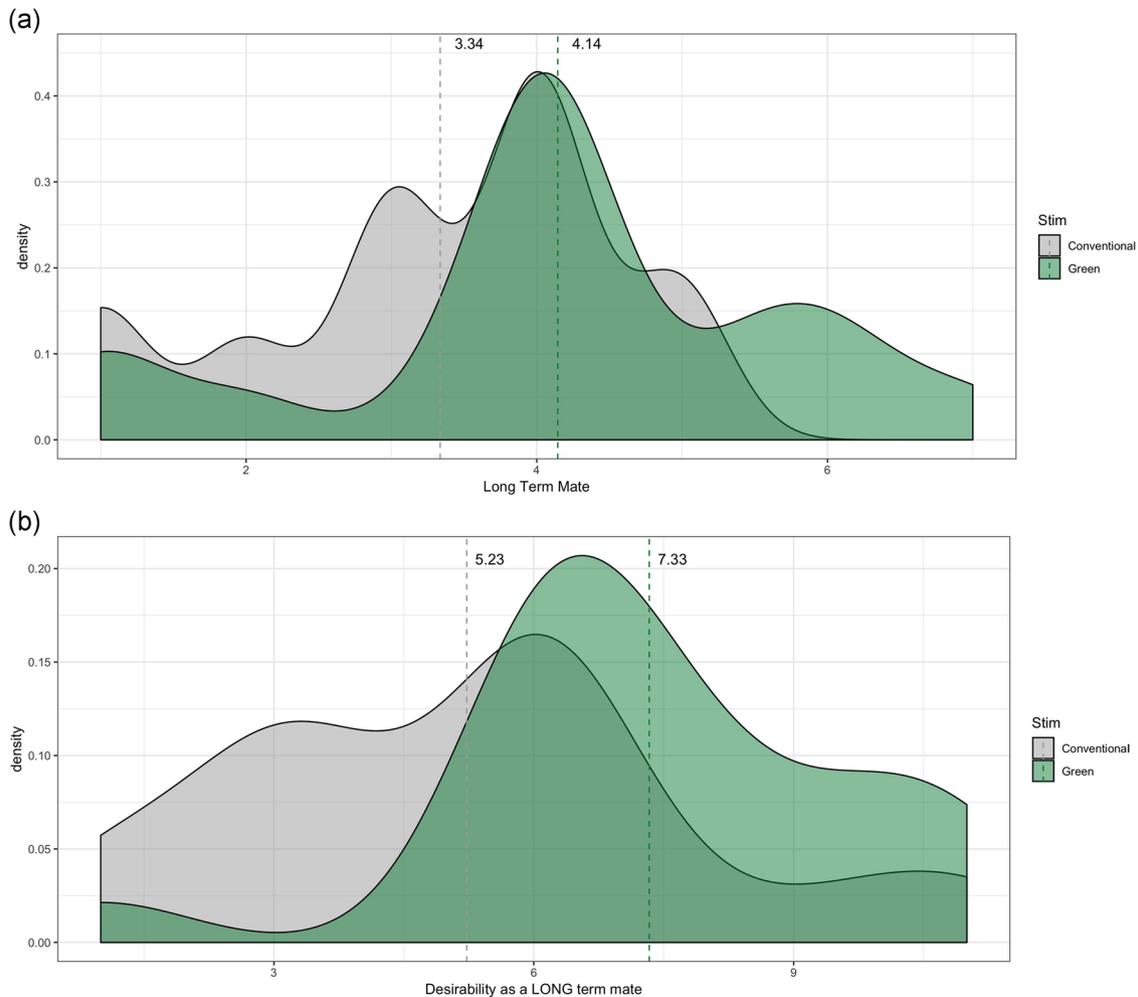


FIGURE 2 (a) Perceived long-term mating value of the imaginary owner of green products (among single women). (b) Perceived desirability of the imaginary owner of green products as long-term mate (among single women) [Color figure can be viewed at wileyonlinelibrary.com]

Previous research suggested that the green-feminine stereotype could threaten men's gender identity (Brough et al., 2016), thus perhaps decreasing preferences among heterosexual women and undermining male green consumers' mating value. While we confirm the existence of this green-feminine stereotype, our findings partly contrast with previous conclusions regarding the threatening potential of green consumption for men. It appears that (a) women do not perceive male green consumers as less masculine and that (b) men owning green products are rated as more desirable long-term partners by single women. In sum, the results of this study suggest that men owning green products can actually increase their mating value.

Green consumption is particularly valued for long-term relationships (Didonato & Jakubiak, 2016), probably because its associated feminine/altruistic traits are an indicator of a man's willingness to invest in partner and offspring (Fletcher et al., 2004). Study 2's findings thus complement previous research emphasizing that kindness and cooperation (Farrelly et al., 2007; Miller, 2007) are valued by women in mate choice purely for the benefits accrued from parenting/partner qualities (Farrelly, 2011; 2013).

The following studies (3, 4a, and 4b) further investigate the potential link between women's perceptions of a man's eco-friendly consumption and his parental and partner qualities. We test the effect of fatherhood (Study 3), involvement as a father (Study 4a), and involvement as a partner (Study 4b) on women's perceptions of male consumers.

6 | STUDY 3

The purpose of Study 3 is to determine whether men who have children are perceived by women as eco-friendlier and as better partners than childless men.

6.1 | Method

After discarding eight respondents who indicated that they preferred to date same-sex individuals, 194 female participants were retained for analysis ($M_{\text{age}} = 48$, $SD = 14$, $\text{min} = 18$, $\text{max} = 75$) and were randomly exposed to a picture of a man alone ($N = 97$) or to a picture of the same man with a child ($N = 97$). The pictures were strictly identical to make

sure that any inferences made regarding either man could not be due to any cues other than the presence (or the absence) of a child, suggesting that the man was a dad (or not)¹. We utilized the same measures as in Study 1. Appendix 3 lists all the items, with descriptive statistics and Cronbach's α scores for the scales. Female participants were asked to rate the perceived eco-friendliness, masculinity and femininity, altruism, commitment as a dad, and commitment as a partner of the man pictured on the visual they were exposed to.

6.2 | Results

Figure 1 displays the distribution of scores assigned to the men pictured with or without a child on their side. Participants' inferences about the eco-friendliness, masculinity, and femininity of men were unaffected by the presence of a child at their side. However, men pictured with a child at their side were perceived as more altruistic and as being better fathers and partners.

A series of regressions further confirmed this pattern of results, in which eco-friendliness, masculinity and femininity, altruism, commitment as a dad, and commitment as a partner were entered as dependent variables; the stimulus (picture of a man with or without a child) was entered as the predictor; and age, parental status, dating status, and perceived green-self-identity were entered as covariates, as in the other studies (Table 5). These analyses confirmed that men pictured with a child were not more likely than men pictured without a child to be perceived as eco-friendly ($t(188) = 0.3$; $p = .75$), masculine ($t(188) = -0.4$; $p = .70$), and feminine ($t(188) = 1.1$; $p = .26$). However, and as expected, they were perceived as more altruistic

($t(188) = 2.4$; $p = .02$) and as being better dads ($t(188) = 2.4$; $p = .02$) and better partners ($t(188) = 3.9$; $p < .001$).

6.3 | Discussion

The results of Study 3 show that men who have children are not perceived by women as eco-friendlier, more feminine or less masculine than childless men—although they are perceived as more altruistic and as being better dads and partners. These positive associations with fatherhood are consistent with prior findings (Banchevsky & Park, 2016). Perceived altruism, in particular, can be explained by the fact that fathers are generally viewed as breadwinners who provide for their family (e.g., Troilo & Coleman, 2008). However, the results of this study suggest that women's inferences about a man's eco-friendliness and feminine/masculine traits are not influenced by a man's parental status. Therefore, the mere fact of being a father is not enough to trigger inferences about a man's eco-friendly consumption and its associated feminine traits. In the next studies, we investigate whether commitment as a father and as a partner is associated with green consumption.

7 | STUDIES 4a AND 4b

Study 3 showed that men who have children are not perceived by women as eco-friendlier than childless men. Studies 4a and 4b extend Study 3's findings by investigating whether committed fathers (Study 4a) and committed partners (Study 4b) are perceived by women as eco-friendlier than noncommitted fathers and noncommitted partners.

TABLE 5 Regression results, Study 3

	Dependent variable					
	EcoFriendliness (1)	Masculinity (2)	Femininity (3)	Altruism (4)	GoodDad (5)	GoodPartner (6)
Stimulus dad	0.04 (0.12)	-0.05 (0.14)	0.15 (0.14)	0.31* (0.13)	0.50*** (0.13)	0.32* (0.13)
Age	-0.14* (0.06)	-0.09 (0.07)	-0.14* (0.07)	-0.11 (0.07)	-0.13 (0.07)	-0.16* (0.07)
Children	0.38** (0.14)	0.28 (0.16)	0.27 (0.16)	0.30* (0.15)	0.33* (0.15)	0.36* (0.15)
Status single	0.14 (0.14)	-0.09 (0.16)	-0.14 (0.15)	-0.18 (0.14)	-0.21 (0.14)	-0.06 (0.15)
Green self id	0.38*** (0.05)	0.17** (0.06)	0.21*** (0.05)	0.26*** (0.05)	0.20*** (0.05)	0.22*** (0.05)
Constant	-2.27*** (0.28)	-1.01** (0.32)	-1.27*** (0.31)	-1.62*** (0.30)	-1.40*** (0.29)	-1.50*** (0.30)
Observations	194	194	194	194	194	194

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

7.1 | Method

After discarding six respondents in Study 4a and eight respondents in Study 4b who indicated that they preferred to date same-sex individuals, respectively 191 female participants ($M_{age} = 35$, $SD = 10$, $min = 18$, $max = 60$) and 195 female participants ($M_{age} = 34$, $SD = 10$, $min = 18$, $max = 62$) were retained for analysis. The participants were randomly exposed to one of two vignettes describing an imaginary man (see the vignettes in Appendices 4 and 5). In Study 4a, the two vignettes were very similar: they described a married man with two children and a good and honest person. The two vignettes, however, differed with respect to the parental skills of the imaginary man. In one condition, the man was described as a very committed dad ($N = 94$), while in the other condition, the man was described as a noncommitted dad ($N = 97$). Similarly, in Study 4b, the two vignettes were very similar: they described a man who is a good and honest person. The two vignettes, however, differed with respect to the faithfulness of the imaginary man. In one condition, the man was described as a very committed partner ($N = 96$), while in the other condition, the man was described as a noncommitted partner ($N = 99$).

In both studies, we utilized the same measures as in Study 3. Appendices 6 and 7 lists all the items, with descriptive statistics and Cronbach's α scores for the scales. Female participants were asked to rate the perceived eco-friendliness, masculinity and femininity, altruism, commitment as a dad, and commitment as a partner of the man described in the vignette they were exposed to.

7.2 | Results

Figure 1 displays the distribution of scores assigned to the committed versus noncommitted fathers (Study 4a) and the committed versus noncommitted partners (Study 4b). Men described as committed dads and men described as committed partners were perceived as eco-friendlier, more feminine, and more altruistic as well as being better dads and better partners.

We performed a series of regressions that confirmed these results. In these regressions, eco-friendliness, masculinity, and femininity, altruism, commitment as a dad, and commitment as a partner were entered as dependent variables; the stimulus (vignette describing a married man who was a good dad or not for Study 4a; vignette describing a man who was a faithful partner or not for Study 4b) was entered as the predictor; and age, parental status, dating status, and perceived green self-identity were entered as covariates, as in the other studies. In Study 4a (Table 6), these analyses confirmed that men described as good dads were perceived as more eco-friendly ($t(185) = 6.1$; $p < .001$), more feminine ($t(185) = 13.6$; $p < .001$), and less masculine ($t(185) = -5.8$; $p < .001$) than men described as bad dads. Moreover, and as expected, they were perceived as more altruistic individuals ($t(185) = 11.5$; $p < .001$), better dads ($t(185) = 7.4$; $p < .001$), and more committed partners ($t(185) = 28.5$; $p < .001$).

In Study 4b (Table 7), these analyses confirmed that men described as committed partners were perceived as more eco-friendly ($t(189) = 2.7$; $p = .007$), more feminine ($t(189) = 7.7$; $p < .001$), and less masculine ($t(189) = -1.9$; $p = .06$) than men described as

TABLE 6 Regression results, Study 4a

	Dependent variable					
	EcoFriendliness (1)	Masculinity (2)	Femininity (3)	Altruism (4)	GoodDad (5)	GoodPartner (6)
Stimulus good dad	0.80*** (0.13)	-0.78*** (0.13)	1.40*** (0.10)	1.26*** (0.11)	1.79*** (0.06)	0.94*** (0.13)
Age	-0.02 (0.07)	0.04 (0.07)	-0.01 (0.06)	-0.16** (0.06)	-0.05 (0.03)	-0.13 (0.07)
Children	-0.06 (0.14)	0.12 (0.15)	-0.03 (0.11)	0.08 (0.12)	0.01 (0.07)	-0.06 (0.14)
Status single	-0.17 (0.15)	0.15 (0.15)	-0.24* (0.11)	-0.08 (0.12)	-0.02 (0.07)	-0.37** (0.14)
Green self id	0.15** (0.05)	0.08 (0.05)	0.06 (0.04)	0.11** (0.04)	0.04 (0.02)	0.04 (0.05)
Constant	-1.01*** (0.26)	-0.12 (0.27)	-0.89*** (0.21)	-1.16*** (0.22)	-1.07*** (0.13)	-0.49 (0.25)
Observations	191	191	191	191	191	191

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 7 Regression results, Study 4b

	Dependent variable					
	EcoFriendliness (1)	Masculinity (2)	Femininity (3)	Altruism (4)	GoodDad (5)	GoodPartner (6)
Stimulus good partner	0.38** (0.14)	-0.28 (0.14)	0.97*** (0.13)	1.01*** (0.12)	1.45*** (0.10)	1.76*** (0.07)
Age	-0.04 (0.08)	0.02 (0.08)	0.04 (0.07)	0.001 (0.07)	0.04 (0.05)	0.002 (0.04)
Children	0.23 (0.16)	-0.07 (0.17)	0.05 (0.14)	0.18 (0.14)	0.04 (0.11)	0.07 (0.08)
Status single	-0.03 (0.16)	-0.25 (0.16)	-0.03 (0.14)	0.11 (0.14)	0.02 (0.11)	0.03 (0.08)
Green self id	0.19** (0.06)	0.04 (0.06)	0.08 (0.05)	0.10 (0.05)	0.07 (0.04)	0.04 (0.03)
Constant	-1.17*** (0.33)	0.05 (0.34)	-0.88** (0.30)	-1.10*** (0.29)	-1.09*** (0.23)	-1.08*** (0.16)
Observations	195	195	195	195	195	195

Note: Unstandardized regression coefficients with standard errors in brackets.

** $p < .01$.

*** $p < .001$.

noncommitted partners. Again, and as expected, they were perceived as more altruistic individuals ($t(189) = 8.1$; $p < .001$), better dads ($t(189) = 14.9$; $p < .001$), and more committed partners ($t(189) = 25.9$; $p < .001$).

7.3 | Discussion

Committed fathers (Study 4a) and committed partners (Study 4b) are both perceived to be eco-friendlier, more feminine, and less masculine than noncommitted fathers and partners. These findings further clarify the crucial role of male commitment, both as a father and as a partner, in women's perceptions of a man's eco-friendliness and its associated feminine and masculine traits.

Our previous findings revealed that eco-friendly consumption did not trigger any inference about a man's level of masculinity. Interestingly, we find that involvement as a father and partner leads to lower perceived masculinity. This result is consistent with previous research showing that as they become increasingly involved in the education of their children, fathers tend to be viewed as increasingly more maternal and decreasingly less paternal (Banchefsky & Park, 2016), with paternal traits being masculine in nature (e.g., ambitious, assertive, authoritative).

The fact that women perceive men to be more environmentally friendly consumers when they are involved partners/fathers is an interesting and unprecedented result. This goes in the expected direction that green consumption could act as a signal of male mating value, as it conveys a potential for commitment. To verify whether this signal is honest, it is necessary to examine men's likelihood to engage in green consumption, based on their level of commitment.

8 | STUDY 5

Studies 1 and 2 showed that male green consumers are perceived as more feminine and altruistic and as being better dads and better partners for a long-term relationship. Studies 3, 4a, and 4b showed that fathers are not perceived as more eco-friendly than childless men, but that committed fathers and committed partners are. The objective of Study 5 is to verify whether these inferences about men are true. More specifically, we examine whether committed fathers and committed partners are more likely to engage in eco-friendly consumption behaviors and the extent to which they perceive themselves as green consumers. Additionally, as a corollary, we investigate whether men who wish to engage in a long-term relationship present and define themselves as eco-friendly consumers.

8.1 | Method

After filtering out 30 participants who had an exclusive preference for dating men, the sample consisted of 470 men ($M_{\text{age}} = 33$, $SD = 10$, $\text{min} = 18$, $\text{max} = 60$). In this survey, the respondent's green consumption orientation was captured with two different variables. The first variable is an index based on a set of self-reported green consumption behaviors (Hand, 2019). More specifically, men were asked how often they engaged in different eco-friendly consumption behaviors related to transport, everyday product consumption, or resource conservation (e.g., *use public transport rather than travel by car, buy recycled paper products, keep the tap running while brushing teeth*) on a scale from 1 (never) to 5 (always). The second variable is based on men's self-perception of their green identity.

Men indicated their level of agreement with three statements related to their self-perception of being an environmentally conscious consumer (e.g., *I am a consumer who cares about the natural environment*; adapted from Barbarossa et al., 2015).

Then, men indicated if they had children, and they were asked to rate their level of commitment as a dad with two different variables. The first variable was based on men's self-reported behaviors as a committed parent and was captured with five items (e.g., *I spend time playing with my child*); the second variable was based on men's self-perception of their parenting skills and was captured with three items (e.g., *People think of me as a good dad*). Respondents were also asked to indicate whether they were involved in a committed relationship, as well as their willingness to commit to a long-term relationship if they were single. Finally, committed men indicated the level of eco-friendliness of their partner. Other sociodemographic information, such as the respondent's age, socioeconomic status, number of children, and age of children, were asked at the end of the protocol. Appendix 8 lists all the items, with descriptive statistics and Cronbach's α scores for the scales.

8.2 | Results

8.2.1 | Are fathers eco-friendlier than childless men?

To examine whether fathers were more environmentally friendly than childless men, we ran two regression models² with our two different measures of green consumption orientation as the dependent variables (i.e., the green consumption behavior index and the perceived green self-identity scale); parental status (childless vs. parent) as the predictor variable; and age as the control variable (See Tables 8 and 9). We did not detect any effect of parenthood either on the green consumption behavior index ($t(467) = 0.45$; $p = .65$) or on the perceived green self-identity scale ($t(467) = 0.66$; $p = .51$).

8.2.2 | Are committed fathers eco-friendlier than noncommitted fathers?

To examine whether committed fathers were eco-friendlier than noncommitted fathers, we ran two sets of regressions on the two different measures of parental skills (see Table 8 and 9).

First, we ran two regression models with the two measures of green consumption orientation as the dependent variables, respectively; the self-reported behavioral measure of parental commitment as the predictor variable and age as the control variable (see Table 8 and 9).

These analyses showed that committed fathers did not indicate being eco-friendlier: green consumption behavior index ($t(141) = 0.80$; $p = .42$) and perceived green self-identity ($t(141) = -0.234$; $p = .82$).

Second, we ran two regression models with, again, the two measures of green consumption orientation as the dependent variables, respectively; but this time with the self-perception of parenting skills as the predictor variable and age as the control variable (See Tables 8 and 9). Again, these analyses did not find an effect of parental commitment on green consumption: green consumption behavior index ($t(141) = 0.25$; $p = .80$) and perceived green self-identity scale ($t(146) = 1.294$; $p = .20$).

8.2.3 | Are committed partners eco-friendlier than noncommitted partners?

Again, we ran two regression models with the two measures of green consumption orientation as the dependent variables, respectively, the respondent's relationship status (single or in a committed relationship) as the predictor variable, and age as the control variable (See Tables 8 and 9). These analyses showed that committed men reported being more environmentally friendly (green consumption behavior index: $t(467) = 2.282$; $p = .02$). Note that this effect is not very strong, but it remains significant after controlling for the respondents' socioeconomic level ($t(466) = 2.490$; $p = .01$). The effect is no longer significant after controlling for the partner's level of eco-friendliness ($t(466) = 0.258$; $p = .79$). This interesting result will be further discussed. Finally, committed men did not present themselves as eco-friendlier than single men and noncommitted partners (perceived green self-identity: $t(467) = 1.239$, $p = .22$; see Figure 3).

8.2.4 | Are men who wish to engage in a long-term relationship eco-friendlier?

Finally, we ran two regression models with the same two measures of green consumption orientation as the dependent variables, respectively; single men's willingness to engage in a long-term relationship (willingness to commit or not) as the predictor variable; and age as the control variable (see Tables 8 and 9). These analyses showed that single men who wish to commit to a long-term relationship were not significantly more likely to engage in eco-friendly consumption behaviors than single men who did not wish to commit (green consumption behavior index: $t(141) = 1.35$; $p = .18$). However, single men who wish to commit to a long-term relationship presented themselves as eco-friendlier: they reported a higher level of green self-identity ($t(196) = 2.511$; $p = .01$; see Figure 3).

8.3 | Discussion

The results of Study 5 revealed that committed men engage in more eco-friendly consumption behaviors than noncommitted men and that this eco-friendly consumption is influenced by their partners' environmental consciousness. This significant effect of the partner's environmental consciousness on men's green consumption suggests that partners tend to influence each other, leading to the well-documented phenomenon of joint decision making in household consumption (Krishnamurthi, 1983). However, the fact that men act

²Note that we performed regressions for the sake of clarity and consistency with the previous analyses. However, in this study, we do not infer any causal relationship between the variables (see correlation table in Figure 3).

TABLE 8 Regression results, Study 5; with the green consumption behavior index as the dependent variable

	Dependent variable				
	Green consumption behavior index				
	(1)	(2)	(3)	(4)	(5)
Dad	0.03 (0.06)				
Good dad index		0.02 (0.03)			
Good dad self			0.01 (0.04)		
Committed partner				0.11* (0.05)	
Single who wish to commit					0.10 (0.07)
Age	-0.01 (0.03)	0.02 (0.05)	0.02 (0.04)	-0.01 (0.02)	-0.02 (0.04)
Constant	3.04*** (0.03)	2.91*** (0.17)	3.00*** (0.24)	2.98*** (0.04)	2.95*** (0.05)
Observations	470	144	149	470	199

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

*** $p < .001$.

in accordance with their female partner's environmental convictions and expectations can also be interpreted as an honest signal of men's commitment. From this perspective, men do not adopt green behavior just as a signaling game—they adopt green behavior

because they are genuinely in a different mindset when they are committed to a partner: they act more cooperatively. As a proof of their cooperativeness and genuine commitment, they are willing to adapt their behavior and engage in green consumption. This result

TABLE 9 Regression results, Study 5; with the green self-identity variable as the dependent variable

	Dependent variable				
	Green self-identity				
	(1)	(2)	(3)	(4)	(5)
Dad	0.11 (0.16)				
Good dad index		-0.02 (0.08)			
Good dad self			0.16 (0.12)		
Committed partner				0.18 (0.14)	
Single who wish to commit					0.55* (0.22)
Age	-0.06 (0.08)	-0.20 (0.14)	-0.19 (0.13)	-0.05 (0.07)	-0.05 (0.11)
Constant	4.33*** (0.09)	4.50*** (0.51)	3.50*** (0.71)	4.26*** (0.11)	4.07*** (0.14)
Observations	470	144	149	470	199

Note: Unstandardized regression coefficients with standard errors in brackets.

* $p < .05$.

*** $p < .001$.

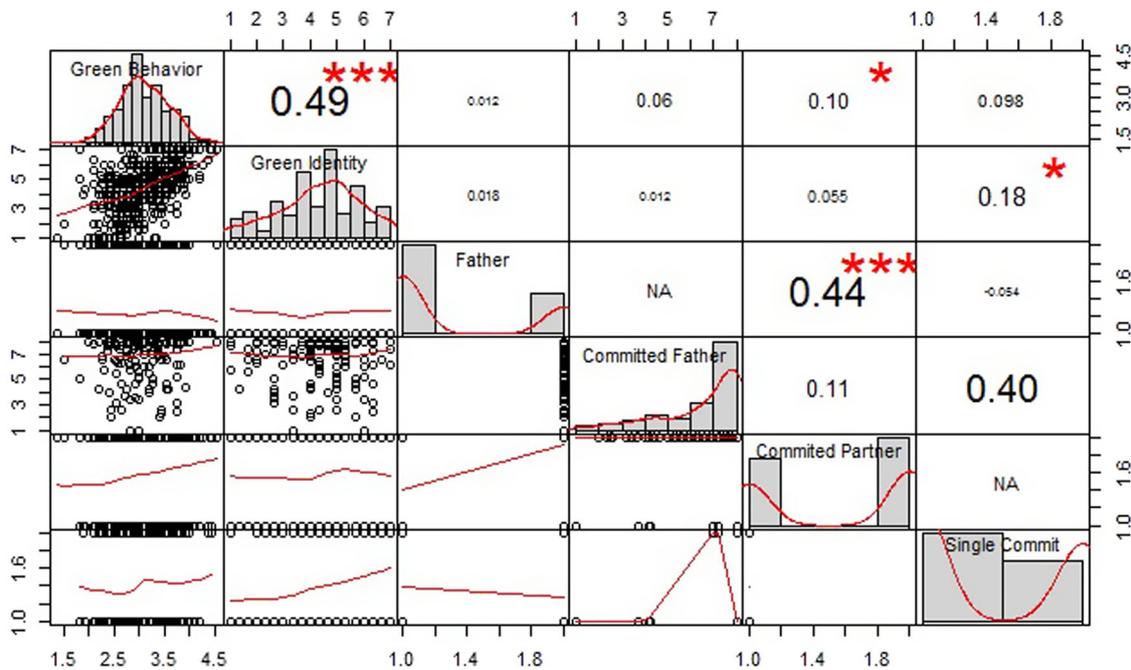


FIGURE 3 Respondents' green consumption and green identity depending on their parental and relationship status—Study 5 [Color figure can be viewed at wileyonlinelibrary.com]

suggests that men's eco-friendly consumption is an honest signal of partner commitment.

The results of Study 5 also revealed that single men who wish to engage in a committed relationship claim to have a strong green self-identity, but in reality, they do not report more eco-friendly consumption patterns compared with single men who do not seek to commit. Single men looking for a committed relationship were expected to signal cooperative behavior (Tognetti et al., 2016; Van Vugt & Iredale, 2013) to increase their value on the mating market. It seems that these consumers project themselves as eco-friendly consumers but that they do not yet act in an environmentally friendly fashion. In other words, they present themselves as eco-friendlier, but their actions are not consistent. This result might hint at a dishonest signal from single men who wish to commit.

Finally, Study 5's results showed that neither fathers nor committed fathers reported greener consumption behavior or greener self-identity compared with childless men or noncommitted fathers. While the result concerning fathers mirrors the findings of Study 3 (i.e., fatherhood itself does not signal eco-friendliness to women), the result concerning committed fathers is not consistent with women's perceptions depicted in Study 4a (i.e., father commitment signals eco-friendliness to women). This latter finding highlights a discrepancy between women's perceptions and committed fathers' actual pro-environmental orientation. One explanation could be that fatherhood, and parenthood in general, implies other priorities that are not always in line with environmental preservation. Thomas, Fisher, Whitmarsh, Milfont, and Poortinga (2018), for instance, found that having a new child generally leads to a decrease in the frequency of pro-environmental behaviors. They

conclude that "the transition to parenthood is a time where concern is prioritized on the immediate wellbeing of the child and not on the future environmental threats" (p. 261).

In sum, it appears that women's perception of an association between men's eco-friendliness and relationship commitment is based on actual grounds, whereas women's perception of an association between men's eco-friendliness and father commitment is not supported.

9 | GENERAL DISCUSSION

This research contributes to the small yet growing body of literature that investigates the signaling role of pro-environmental consumption in mate selection. Previous research revealed that men who engage in green consumption behaviors are subject to a green-feminine stereotype that threatens their masculine identity (Brough et al., 2016; Shang & Peloza, 2016), which may decrease their mate value with the opposite sex. Partly opposing these previous conclusions, our current research shows that men who engage in green consumption are likely to increase their mate value under specific circumstances.

More precisely, we found that men who display green consumption behaviors are perceived as more environmentally conscious, more feminine, and more altruistic (Study 1) and are perceived by heterosexual women as more desirable long-term (but not short-term) partners (Study 2). Fatherhood has no effect on women's inferences about a man's eco-friendliness though (Study 3), while father commitment (Study 4a) and partner commitment (Study 4b) do. Finally, we checked whether these inferences about men are true (Study 5). We found that (a) fathers, even committed ones, are not

eco-friendlier consumers and that (b) committed men are eco-friendlier consumers, suggesting that green consumption is an honest signal of partner commitment but not of father commitment, while (c) single men who wish to commit to a long-term relationship state consuming in an eco-friendly way but do not behave accordingly, suggesting that single men may be playing a signaling game.

9.1 | Theoretical contributions

This research addresses the thorny issue of men's green consumption, as the extant literature highlights a shortage in men's adoption of pro-environmental behaviors (e.g., Davidson & Freudenburg, 1996; Zelezny et al., 2000). Although this green-gender gap is well documented in the literature, its origins and mechanisms have not been completely elucidated so far. Most existing research relies on gender socialization theory (cf. Luchs & Mooradian, 2012; Milfont & Sibley, 2016), blaming the green-feminine stereotype to explain this gender effect. Although we do not question whether the differences observed between men and women in terms of environmentally friendly consumption are partly due to socialization and gender expectations, we use a different but complementary framework. In this research, we apply insights from evolutionary psychology, and more specifically mate selection and signaling theory, to shed a new and interesting light on the green-feminine stereotype and the green-gender gap phenomenon. We introduce the idea that green consumption, on top of signaling conventionally feminine qualities, such as altruism, might signal (and might be used to signal) men's potential and willingness to lastingly commit to a romantic relationship.

The main contribution of this research is that it investigates this issue from two different standpoints: we not only examine the type of signal sent by men who adopt green consumption behaviors as long-term versus short-term partners but we also assess the extent to which men truly engage in green consumption, based on their parental and romantic situation, commitment, and aspirations. The present article offers new insights into the link between pro-environmental behavior and mating preferences by putting these two lines of research into perspective. First, our research is consistent with previous conclusions that altruism and prosocial behavior, including pro-environmental behavior, signal good partner qualities, and long-term mating value (e.g., Bhogal, Farrelly, & Galbraith, 2019; DiDonato & Jakubiak, 2016). In particular, altruism signals a potential for commitment towards a romantic partner (Barclay, 2010; Bhogal et al., 2019). Second, our findings support the idea that prosocial and cooperative behaviors might be driven by mating motivations, especially among men (e.g., Farrelly et al., 2007; Tognetti et al., 2016; Van Vugt & Iredale, 2013). More specifically, we show that male eco-friendly behavior signals high partner commitment and that indeed committed men tend to engage more in eco-friendly behavior.

Finally, our research highlights two possible mechanisms drawn from evolutionary psychology: one related to signaling, the other one to life-history strategy. First, our results suggest that men might signal their eco-friendliness to (consciously or not) communicate their

altruism and cooperativeness to increase their current or future long-term mating success, in line with a signaling strategy. Second, our results suggest that men do buy more green products once they settle down in a committed relationship, in line with men's slow life-history strategy (Del Giudice, Gangestad, & Kaplan, 2016). When men settle down in a relationship, their level of testosterone tends to drop significantly (Burnham et al., 2003; Gray & Campbell, 2009; Gray et al., 2002; Gray et al., 2004; Gray, Yang & Pope, 2006). This drop of testosterone, in turn, increases men's levels of altruism and cooperation—key qualities to become a good long-term mate and a good father (Kruger & Kruger, 2018; Li et al., 2018). These higher levels of altruism and cooperation probably increase their likelihood to behave pro-environmentally. This could be at the origin of the green-feminine stereotype. That is, men are perceived as more feminine when they buy green products because they act more altruistically and cooperatively, and these qualities are more common among women (Soutschek et al., 2017). In our view, evolutionary psychology helps us uncover the ultimate explanation of the green-feminine stereotype: men who buy green products are perceived as more feminine because they do act in a more feminine way (i.e., more cooperative, more altruistic); while gender socialization theory sheds a light on the proximate explanation of the green-feminine stereotype: men who buy green products are perceived as more feminine because they do not conform to the traditional masculine gender role. Although they appeal to different research cultures and traditions, these two rationales are not contradictory.

9.2 | Managerial implications

The current research showed that green consumption signals not only femininity, but also altruism, parental care, and romantic commitment and that this positive signaling drives single women's preference towards eco-friendly men as long-term partners. The link between eco-friendliness and long-term mating appeal suggests that the signal of femininity sent by eco-friendly consumption is not systematically negative for men: men's eco-friendly consumption may be of more interest to (potential) female partners than generally believed in previous research. Men's behaviors tend to be strongly influenced by women's mate preferences (Griskevicius, Cantú, and Vugt 2012). If men adapt their green behavior to accommodate women's preferences, they will ultimately increase their value as long-term partners. Therefore, a relevant lever in shaping men's behavior may be information conveying the positive impression made by men's green consumption. This finding has relevant implications for marketers aiming to promote green products among male consumers, as well as for policymakers and NGOs aiming to persuade male individuals to embrace more environmentally responsible consumption behaviors (e.g., bringing one's own bag when grocery shopping, taking public transportation, or avoiding using cars for short distances).

First, practitioners may consider developing advertisements and pro-environmental campaigns showing that men owning green products (or engaging in green consumption behaviors) are viewed as more altruistic, trustworthy, and committed across contexts,

including romantic contexts, and that they are highly valued as long-term partners by the opposite sex. Committed men and men seeking to commit to a long-term relationship will, therefore, be more likely to engage in green consumption behaviors to increase their mating value, even though these behaviors might communicate a somewhat gender-incongruent identity.

Second, if green consumption functions as a signal of men's romantic commitment or willingness to commit, then marketers should reposition their products when targeting these men to help them signal altruism and cooperation. There are several products or services that are purchased by committed partners (e.g., engagement rings, apps for couples, food products, travel or resorts for couples, restaurants) or by individuals who may seek to commit to a long-term relationship (e.g., dating apps for long-term love, travel or resorts for singles looking for a long-term relationship). Marketers could benefit from emphasizing these products' green attributes (e.g., ethical and sustainable engagement ring, eco-travel). By emphasizing a "green mate appeal" effect, men will strategically showcase their eco-friendly orientation as an honest signal of their underlying partner qualities, which should, in turn, improve their attractiveness with potential mates. Simultaneously, women will benefit from obtaining honest information about the signaler.

Finally, and as shown in these examples, practitioners may consider using the research findings to segment and profile consumers when promoting eco-friendly products in the market. They may include ecological concerns, of course, but also romantic commitment and aspiration as segmentation variables. In so doing, they may cluster and identify consumers with different eco-friendly behaviors, self-identity and self-presentation priorities, and motivations. They may, therefore, consider developing tailored products, promotion strategies, and persuasion appeals.

9.3 | Limitations and future research

First, our results showed that single men are less likely to engage in green consumption than men who are in a relationship. We did not further explore single men's green consumption though. As the share of single individuals is growing in industrialized and developed countries (Chamie, 2017; DePaulo, 2019; Wang & Parker, 2014), a reduced romantic commitment may lead to an even more severe environmental deterioration. Available secondary data (Eurostat, 2017) reveal that the share of European single men is increasing over time. Future research might explore whether an increase in single men is correlated with a decrease in green consumption and whether the long-term mating aspiration of single men moderates this link.

Second, we did not compare products that are consumed in a private versus public setting. Single men who wish to signal their romantic commitment through green consumption may prioritize green alternatives that are consumed in public settings to conspicuously advertise their mating qualities and maximize their mating success—while partnered men can be motivated to consume these products in both contexts. Previous research addressing the conspicuousness of green consumption often compared green products to

luxury products (Didonato & Jakubiak, 2016; Johnson, Tariq, & Baker, 2018). This choice may be problematic for several reasons. First, there is a potential confounding effect derived from the implicit associations between luxury products and romantic faithlessness (Sundie et al., 2011). Second, luxury products are not the typical alternative to green products in real-life consumption situations, which limits the empirical scope of the findings. Finally, because the conspicuous products that were previously examined are not gender-neutral (e.g., cars, grocery bags), this could also constitute a major bias, especially when looking at perceived feminine/masculine traits of male owners. Future research could examine how male green consumers are perceived and how desirable they are rated depending on the combined effects of conspicuous (vs. private) and gender-feminine (vs. gender-masculine) characteristics of the green products they own.

Third, the age of both male and female participants in this research varied substantially across the different studies (from 18 to 75 years old). The participants' mean age ranged from 33 to 48 years old. Age plays a pivotal role in mate selection, with young individuals, for example, being more interested in short-term mating. Our diversified and quite high age range may reduce the generalizability of our findings to younger segments of the population. We did control for age in all our analyses, but future research may consider focusing on younger respondents to assess potential differences in the observed effects.

Fourth, the effects found in our research could have been driven by the lowest ratings attributed to the neutral conditions in our five experiments (e.g., non-green conditions, childless men, noncommitted partners). To avoid confounding effects that may derive from using biased stimuli for the neutral conditions (e.g., luxury products as equivalent to neutral non-green products), we used conventional, regular non-green alternatives that were previously used in academic research in Studies 1 and 2 (Brough et al., 2016), and we developed neutral narratives in Studies 3 and 4. The results show that the mean scores for the measured dependent variables (e.g., eco-friendliness, altruism, femininity) in the neutral conditions are rather close to the neutral point across studies (that is, 4 on a 1–7 point Likert scale; cf. Figure 1). While these results may confirm the unbiased nature of the neutral stimuli and the reliability of our results, we acknowledge that the study design does not fully eliminate the possibility that the observed effects could be (partially) driven by the respondents' perceptions of users of non-green products, childless men or noncommitted fathers or partners, as these individuals may be perceived to possess lower levels of the measured qualities.

Fifth, we have not examined the potential effects of women's individual predispositions and attitudes on their perceptions of male eco-friendly consumers. Future research should further investigate individual profiles that are more likely than others to hold stereotypes about green consumers and the extent to which the "green feminine stereotype" has positive or negative implications from their point of view. In other words, other studies are needed to identify boundary conditions to be able to determine when and how this stereotype can be detrimental and when it can be beneficial in a mating context. Among potential moderators, future studies could examine, for instance, the role of political ideology or feminist ideology and how it affects women's perceptions of male green consumers.

Finally, we show that green consumption is cognitively associated with higher femininity, confirming the green-feminine stereotype (Brough et al., 2016). However, our results do not fully support the existence of a green-low masculine association. The results of Studies 1 and 2 suggest that male green consumers are perceived as more feminine but not as less masculine. The results of Study 4a,b suggest that committed fathers and committed partners are perceived as eco-friendlier and more feminine but also as less masculine. In sum, our findings do not completely clarify the existence of a “green-low masculine association” and the (in)dependence of the femininity and masculinity constructs. This mirrors the mixed results in previous literature. On the one hand, Shang and Pelozo (2016) found that ethical consumption is associated with higher femininity and lower masculinity, while Brough et al. (2016) found that green consumption does not impact femininity and masculinity in a symmetrical way. Are femininity and masculinity mutually exclusive or are they independent? Future research is invited to assess when and why femininity and masculinity work as independent rather than as polar ends of a single continuum in green consumption.

In conclusion, recent research claims that eco-friendly consumption is unmanly and that men may avoid eco-friendly consumption to protect their masculine identity. But is eco-friendliness always detrimental to men? In this paper, we show that the answer is a clear “no”: men can actually benefit from the green-feminine stereotype, because green consumption also signals good-mate qualities, such as altruism, and single women tend to prefer altruistic men as long-term mates. We also show that green consumption is an honest and reliable signal of partner commitment but not of father commitment. These findings offer managers and policymakers new and more nuanced insights that could be fruitfully leveraged to reduce the widely discussed gender gap in pro-environmental consumption.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ORCID

Sylvie Borau  <http://orcid.org/0000-0003-1564-0695>

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information section.

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