Consumers' (Not So) Green Purchase Behavior

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The large body of research investigating the discrepancy between consumers' progressive environmental attitudes in polls, and their actual purchase behavior, has provided inconsistent results. This paper complements existing research using an 'interception' of consumers at the shopping aisle, thus using more objective behavioral data. Our analysis indicates a neglectable impact of attitude on intention. Purchase intention, in turn, was found a significant determinant of actual purchase behavior, although the overall impact on the likelihood of choosing a sustainable product is limited. The findings indicate that even positively inclined consumers do not change their purchase behavior owing mainly to economic barriers.

Keywords: sustainable consumption, real product choice, intention-behavior-gap, theory of planned behavior

INTRODUCTION

The rapid loss of biodiversity, increasing resource scarcity and intensifying climate change are threatening the life-support systems of the earth (IPBES, 2019). A United Nations report highlighted consumption patterns of an ever-growing world population as one of the key reasons for these global challenges (UN, 2015). One of the main priorities of environmental movements and policies has therefore been an education campaign aimed at shifting consumer preferences towards more sustainable resource use. As the UN Sustainable Development Goals states, consumers can work towards the goal of sustainable consumption by "reducing [their] waste[,] being thoughtful about what [they] buy and choosing a sustainable option whenever possible" (UN, 2016). Indeed, numerous polls report that consumers not only prefer sustainable products but are willing to pay more for them, including 73% of millennials (Curtin, 2018) and 66% of global respondents (Nielsen, 2015). Similar numbers are reported in many other surveys (CGS, 2019; Cohen, 2018; Toluna, 2019). Yet, these stated responses to pollsters hardly translate to actual buying behavior (Prothero et al., 2011). As overall consumption keeps increasing, the market share of sustainable products remains negligible (Olson, 2013; Terlau & Hirsch, 2015).

The gap between stated and actual purchase behavior regarding sustainable goods attracted researchers trying to understand consumers' motivation for purchasing green products by a variety of factors, such as socio-demographic drivers, cultural values or by using psychological models (Barbarossa

& De Pelsmacker, 2016; Nguyen, Lobo, & Greenland, 2017; Peattie & Charter, 2003). Yet, the results were often inconclusive and contradictory, often depending on the methodology and data input (M. J. Carrington, Zwick, & Neville, 2016). This paper addresses the gap from two angles:

1. How can the 'say-do' gap be characterized when using observed product choices? We model the discrepancy between stated attitudes and actual purchase behavior of consumers for environmentally friendly household goods based on the Theory of Planned Behavior (TPB). The empirical data (n = 220) was gathered through novel in-store observations of purchase behavior with subsequent consumer surveys of the same individuals in three supermarkets around Boston, Massachusetts.
2. What are the main purchase barriers for sustainable household goods? In order to overcome the gap, we are looking for product-specific attributes that stop consumers from buying sustainable products despite potentially positive attitudes and purchase intentions.

THE 'SAY-DO' GAP

A large body of research use psychological models and theories to understand sustainable consumer behavior (Ertz, Karakas, & Sarigöllü, 2016). The growing awareness of environmental destruction and the exploitation of humans in production processes were expected to become the determining factor for consumption choices in the Western world (Caruana, 2007; Schaefer & Crane, 2005; Shaw, Shiu, & Clarke, 2000). Moreover, there was an expectation that consumers would seek to demonstrate their social credentials and appear 'green' through their consumption (Hansen & Schrader, 1997; Miniero, Codini, Bonera, Corvi, & Bertoli, 2014). It was also believed that consumers would perceive sustainable products as having better quality and higher value (Biswas & Roy, 2015; De-Magistris & Gracia, 2016; Forbes, Cohen, Cullen, Wratten, & Fountain, 2009).

The reality, however, has been that consumers typically do not live up to their own set of expressed expectations (Carrigan & Attalla, 2001; Michal J. Carrington, Neville, & Whitwell, 2010, 2014; Roberts, 1996; Schäufele & Hamm, 2018; Titus & Bradford, 1996; Vantomme, Geuens, De Houwer, & De Pelsmacker, 2005). This widespread gap between 'say' and 'do'; between professed concerns about the environment and social justice on the one hand and actual buying behavior on the other, has led to an expanding body of academic research that aims to understand the underlying factors (Carrigan & Attalla, 2001; Michal J. Carrington et al., 2014; Chatzidakis, Hibbert, & Smith, 2007).

In trying to understand consumer behavior and find levers to influence this behavior, researchers have investigated norms and beliefs, socio-demographic profiles, sustainability labels, and knowledge of environmental problems (De-Magistris & Gracia, 2016; Dembkowski & Hanmer-Lloyd, 1994; Hartikainen, Roininen, Katajajuuri, & Pulkkinen, 2014; Vermeir & Verbeke, 2006). For this research, we use the Theory of Planned Behavior (TPB) as it is the most frequently used psychological model for investigating sustainable consumption (Ertz et al., 2016; Grimmer & Miles, 2017). The framework consists of the interplay between attitude, subjective norm, perceived behavioral control, intention, and behavior (Ajzen, 1991). The attitude towards a behavior consists of the expected outcome and an associated evaluation of the outcome. Subjective norm is the perceived social pressure to engage or not to engage in the respective behavior. Perceived behavioral control refers to an individual's perception of their ability to perform a given behavior. The attitude towards the behavior, the subjective norms, and the perceived behavioral control, all frame the intention for the behavior. The intention is an indication of a person's readiness to perform a given behavior and is considered to be the immediate antecedent of behavior (Ajzen, 1985, 1991).

A significant portion of this body of research has focused on the discrepancies between attitude and behavior, between attitudes and intentions, and between intentions and behavior (Michal J. Carrington et al., 2010). While the attitudes and intentions of individuals towards a behavior are almost exclusively captured through surveys, measuring the final behavior can happen either through subjective self-report or objective observation. The majority of studies that investigated the general validity of TPB framework or that tried to explain environmentally friendly behavior through the TPB framework used self-reported

measurements of behavior (Armitage & Conner, 2001; Hassan, Shiu, & Shaw, 2016). Self-reported actions were captured for a wide range of environmentally friendly behaviors, such as recycling (White & Hyde, 2012), engaging in environmental activism (Y. ki Lee, Kim, Kim, & Choi, 2014), performing ecologically conscious (Taufique & Vaithianathan, 2018) or carbon-offset related behaviors (Polonsky, Vocino, Grau, Garma, & Ferdous, 2012) or purchasing green products (Bartels & Onwezen, 2014; Kumar, Manrai, & Manrai, 2017; Nguyen, Lobo, & Greenland, 2016).

On the one hand, using self-reported measures is very rewarding for researchers, as it facilitates the data collection. In addition, the statistical models that include self-reported behavior data were shown to have relatively high coefficient of determination (R^2) (Armitage & Conner, 2001). On the other hand, this subjective data may be inflated as respondents overstate their own behavior to give socially desirable answers and signal their virtue (Hassan et al., 2016; Podsakoff & Organ, 1986). This impacts the general reliability and interpretability of these models and their findings should be therefore treated with care (M. J. Carrington et al., 2016; Hassan et al., 2016).

For example, the above cited studies using self-reported environmentally friendly behavior almost uniformly found a positive and significant relationship of attitude and/or intention of sustainable behavior - yet, these results were not the same when using objectively observed consumption data. The results for the few studies using actual purchasing data were more nuanced, as for example the impact of attitude on actual purchase was not found significant for many organic products (Moser 2016) or would differ among consumer groups (Hauser, Nussbeck, & Jonas, 2013; Schäufele & Hamm, 2018). Furthermore, the effect of intention on behavior was lower for real behavioral data than for self-reported data or was not observed at all (cf. Hassan et al. 2016).

This raised the question of the applicability and validity of using self-reported purchase behavior in the context of the Theory of Planned Behavior and sustainable consumption, resulting in multiple calls for more research using real product choice data (Auger & Devinney, 2007; Michal J. Carrington et al., 2010; Hassan et al., 2016; H. J. Lee & Goudeau, 2014; Miniero et al., 2014; Moser, 2015).

This paper addresses this data gap in a novel way by observing the consumers product choice and surveying the same individuals in one data collection step. Whereas prior research involving real purchase behavior used a combination of panel and household survey data (Hauser et al., 2013; Moser, 2016; Schäufele & Hamm, 2018), this study captured the true product choice in store and could thereby also capture the attitudes and opinions from the consumers at the point of purchase. This may offer additional insights, as both the shopping mode of the consumers and the shop environment are supposed to influence the product decisions and potentially the consumers' attitudes and norms as well (Michal J. Carrington et al., 2014).

THE CONSUMER AND CHOICE DATA

We observed consumer choices at the purchase decision point during what Procter and Gamble calls "the first moment of truth". This is the first 3 - 7 seconds when a consumer interacts with a brand, and when marketers have the best chance of converting a browser into a buyer by appealing to their senses, values and emotions. The consumer's choice observation was followed by an immediate survey. The data were collected in three supermarkets from two chains around Boston, Massachusetts.

The study focused on environmentally friendly household goods, in particular laundry detergents, dishwashing liquids, household cleaners and paper products. The decision to investigate household goods was motivated by the need to distinguish between consumers choosing sustainable products and consumers choosing organic products as the motivation of the latter group may be more health-related rather than environmental (Magnusson, Arvola, Hursti, Åberg, & Sjödén, 2003; Moser, 2016).

The items included in our study draw on Young et al. (Young, Hwang, McDonald, & Oates, 2010), defining sustainable products as 'environmentally friendly', 'ethical' or 'green'. The distinction between a regular and a sustainable household product is adopted from the partner supermarket's internal classification system, which ranks products as 'regular' or 'sustainable'. The distinction between sustainable and regular products in the three stores was facilitated by a conspicuous green enclosure

around the shelf section holding the green products in each aisle. These products were displayed right next to the regular products, making both categories easily recognizable for the consumers (and the researchers).

The data were collected directly in the aisles in two steps. First, observing and documenting a consumer picking up one of the household products under study and the version chosen. Second, asking the consumer to fill out a survey once they reached the end of the aisle and were moving on towards the next shopping aisle. Picking the product out of the shelf, placing it in the carriage, and moving on from the aisle was used as the indication of a purchase. The consumers filled out the survey themselves on a tablet to reduce the social-desirability bias and for the successful completion of the survey they were offered a $5 gift-card for the respective supermarket.

The first page of the survey included a definition and clarification of the terms 'sustainable products' and 'sustainable version'. This page was included to ensure a common understanding of the terminologies among the surveyed shoppers and to make sure to capture the underlying motivations and decision processes for the products investigated (Hughner et al., 2007). The four latent dimensions in this TBP model were derived using multiple indicator questions (Bollen, 1989), where each indicator question was measured with a 7-point bipolar Likert scale, which is commonly used in assessing TPB dimensions (Hassan et al., 2016). On this scale, 7 indicates a positive view ('Strongly Agree') and 1 represents a negative view ('Strongly Disagree'). In addition, respondents were later asked for their socio-demographic profile, adopted from Buder, Feldmann & Hamm (2014). Prior to the final data collection, the questionnaire was tested and feedback from the survey takers was incorporated. A total of 223 interviews were conducted between November 2018 and March 2019. Before running the analysis, the data was screened as suggested in Bollen (1989) and three obviously flawed observations were taken out leaving 220 valid observations.

Appendix A presents the socio-demographic profile of the sample in comparison with the Massachusetts population (ACS, 2018). The majority of the interviewed consumers were women (69%) which is consistent with the still existing gender bias in grocery shopping (Mortimer & Clarke, 2011). The largest group of consumers was between 25 and 34 years old and the average age was 45 years. The large majority of the respondents were white (70%), which matches the general population in Massachusetts and New England. The sample shows a disproportionally large percentage of people with higher education, whereas lower income households were underrepresented. In our case, 14% of the consumers chose the sustainable version of a product, which is significantly higher than the average market share of green household products in the US of below 5% (Packaged Facts, 2015). In our sample, the background of the sustainable consumers was skewed towards higher levels of income and education and therefore confirms the stereotype of green consumers as higher income academics (Finisterra do Paço & Raposo, 2010).

DATA ANALYSIS – THE MODEL

A structural equation model (SEM) was used to investigate the interactions between attitude, subjective norm, perceived behavioral control, the intention to buy, and the actual product choice. The model was set up as shown in Figure 1, following the Theory of Planned Behavior. The first three factors determine the intention, which determines, in turn, the product choice (sustainable or not).

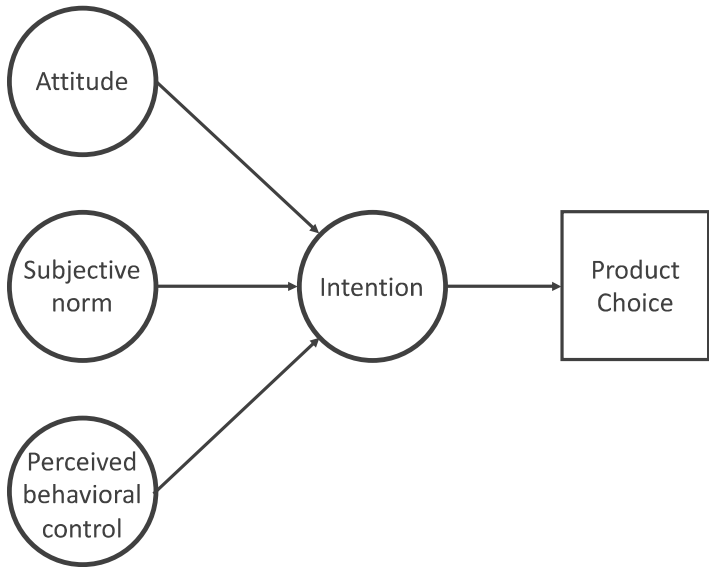
The SEM was analyzed in R using the software packages Lavaan (Version 0.6-3), using multiple imputation to treat missing data via SemTools (Version 0.5-1) and Mice (Version 3.5.0). The association between the intention variable and the dichotomous behavior variable was modelled with a Probit link. The estimator for the SEM is a robust diagonally weighted least squares (DWLS) estimator instead of the more common maximum likelihood because the exogenous variable is categorical and DWLS is more suitable for small sample sizes (Bollen, 1989).

As a first step, the 14 indicator variables were subject to factor analysis to evaluate their relationship to the latent variables. Table 1 presents the questionnaire items and their literature sources of adoption, the means and standard deviations for each indicator variable as well as the loadings of the manifest

variables on the latent variables. All of the loadings were above 0.5 and thus significant (K. Lee, 2011). All four latent variables show a sufficient reliability, as their Cronbach's alpha metrics, the most common measure of internal reliability, are above 0.6 (Kline, 2011).

The resulting structural equation model is displayed in Figure 2. The SEM fit results, following Hair et al. (Hair, Black, Babin, & Anderson, 2010), are mixed: Chi-Square (χ^2) = 214.589 (p-value < 0.001), degrees of freedom (df) = 84, root mean square error of approximation (RMSEA) = 0.08, comparative fitment index (CFI) = 0.82 and Tucker-Lewis-index (TLI) = 0.77. The ratio of Chi-Square to degrees of freedom is 2.55, which is smaller than the recommended bound of 3 (Kline, 2011). In addition, the RMSEA, does not exceed 0.08, which indicates an 'ok' fit (Bollen, 1989). CFI and TLI, however, are smaller than the ideal lower threshold of 0.9.

FIGURE 1
INVESTIGATED MODEL ADAPTED FROM THE THEORY OF PLANNED BEHAVIOR MODEL



(AJZEN, 1991)

The results show, that the attitudes towards sustainable purchases have a significant, but very low positive effect (0.14) on the intention to buy sustainable products. This slight impact of attitude on the formation of purchase intentions demonstrates the existence of an attitude-intention gap and highlights the common observation that positive attitudes towards green consumption translate neither into behavior intentions nor actual behavior, and are overrated in trying to explain or predict consumers' behavior.

Meanwhile, subjective norms strongly impact a consumer's intent to purchase sustainable goods (0.82), which suggests an important role of social norms and preferences for developing green shopping habits. This validates previous findings on the strong impact of norms on behavioral intention (Rivis & Sheeran, 2003) and in particular of the increasing social pressure to go green (Park & Ha, 2012).

The original Theory of Planned Behavior suggests a relevant and significant impact of Perceived Behavioral Control on intention building (Ajzen, 1991). However, the findings of this model do not support this original hypothesis, as the observed association between Perceived Behavioral Control and Intention was minute and insignificant. This discrepancy and non-significance of Perceived Behavioral Control might be explained by the fact, that given the abundancy and availability of purchasing options in modern supermarkets, consumers should in general feel capable of buying the sustainable version of a product.

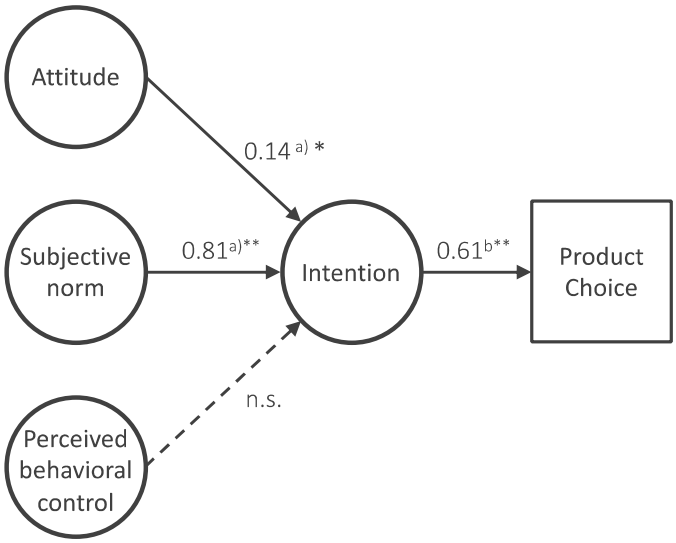
As shown in Figure 2, the effect of intention on behavior was significant and positive. However, since the association between intention and behavior is modelled using a Probit regression, it has to be interpreted with care. The 0.61 intention coefficient indicates that an increase of intention by one standard deviation (SD) increases the z-score of the probability to purchase the sustainable product by 0.61. In our case, the intercept of the sustainable product choice is -1.076, meaning that a consumer with average sustainable purchasing intentions has a 14.1% probability of actually choosing a sustainable product. A consumer with above average intentions (+1 SD in intention) has a 32% probability of selecting a sustainable item and a consumer with an intention far above average (+2 SDs in intention) has, on average, a 56% probability of picking the sustainable products. However, the overall effect of intention on behavior was moderate, as even consumers with very high intentions, had no better likelihood of purchasing a sustainable product than a coin toss landing on heads.

TABLE 2
QUESTIONNAIRE ITEMS AND LATENT VARIABLES

Latent constructs and manifest variables	Mean	Standard Deviation	Factor Loading	Cronbach's Alpha	Sources of adoption
Attitude				0.67	Lee (2011), Moser (2015)
ATT_1: Purchasing sustainable products helps protect the environment	6.01	1.25	0.71		
ATT_2: Specifically buying environmentally friendly products is a good way to lower pollution	5.90	1.25	0.67		
ATT_3: Climate Change needs to be addressed quickly	6.18	1.33	0.56		
Subjective Norm				0.82	Minton & Rose (1997), Moser (2015)
SN_1: Most of my family members think I should use sustainable products	4.62	1.68	0.59		
SN_2: I feel a personal obligation to buy sustainable products	4.98	1.496	0.80		
SN_3: I prefer buying products that are produced in a sustainable way	5.60	1.14	0.77		
SN_4: I prefer buying "green" household products	5.26	1.38	0.75		
Perceived Behavioral Control				0.79	Sheeran, Trafimow & Armitage (2003), Han, Hsu, & Sheu (2010)
PBC_1: If I wanted to, I could easily buy environmentally friendly household products	5.49	1.33	0.81		
PBC_2: If I choose to, I can afford to buy sustainable products	5.50	1.40	0.73		
PBC_3: I feel that sustainable products are available to me	5.41	1.27	0.68		
Intention				0.90	Lee (2011), Yadav & Pathak (2016)
INT_1: I intend to buy environmentally friendly products	5.51	1.16	0.82		

Latent constructs and manifest variables	Mean	Standard Deviation	Factor Loading	Cronbach's Alpha	Sources of adoption
INT_2: I intend to buy products that are produced in a sustainable way	5.55	1.18	0.86		
INT_3: I intend to buy "green" products whenever possible	5.39	1.35	0.85		
INT_4: I am willing to put more effort into buying environmentally friendly products	5.56	1.28	0.82		

FIGURE 2
RESULTING STRUCTURAL EQUATION MODEL



a) regular regression coefficient; b) probit regression coefficient; n.s. = non-significant;
* p < 0.05; ** p < 0.001; circular box = self-reported; square box = observed

PRODUCT-SPECIFIC PURCHASE BARRIERS

As a final step we explored product-specific purchase barriers and thus addressed a granularity that has not received sufficient coverage in the literature (Buder et al., 2014; Michal J. Carrington et al., 2010). As part of the interviews at the point of purchase, consumers were asked to self-report their usual purchase behavior (sustainable vs. regular version) for each of the four household products included in the study. For consumers who indicated to usually buy the regular version, we asked for specific purchase barriers for buying the sustainable variety. The list of purchase barriers was created through preliminary customer interviews before even testing the survey and was complemented with purchase barriers and deterrents from Buder et al. (Buder et al., 2014), Hughner et al. (Hughner, McDonagh, Prothero, Schultz II, & Stanton, 2007) and Vantomme et al. (Vantomme et al., 2005).

Interestingly, out of the 189 respondents who were observed to have chosen the regular version of a specific household product, 55 (~30%) indicated that they usually buy the sustainable version of that particular item. This surprisingly large discrepancy could be explained by respondents not fully understanding the distinction between sustainable and regular products. Alternatively, respondents tried to signal virtue, supporting the findings of Moser (2016) who showed that self-reported purchase behavior is a poor predictor of real purchase behavior.

Across all product groups, price was, by far, the most frequently mentioned purchase barrier (see Table 2), especially for low-income consumers. This is consistent with prior research that states people who have positive attitudes towards green products and who claim to be willing to pay a premium still do not translate their intentions into action because prices for sustainable alternatives remain too high (Hughner et al., 2007).

For each of the products investigated, more than a quarter of the responses indicated lack of familiarity and lack of information as major hurdles. These two barriers relate to each other, as people who have not tried a sustainable product are unlikely to know much about it. This is particularly important, because convenience and shopping habits were stated as purchase hindrances by more than a fifth of the consumers in every product category. In addition, perceived quality was reported as a significant purchase impediment, especially for laundry detergents and household cleaners. This may be due to the fact that consumers perceive environmentally friendly products as gentle to the environment but ineffective as laundry detergent or household cleaner (Luchs, Naylor, & Irwin, 2010). Manufacturers and retailers have known for a long time that consumers will not sacrifice effectiveness in the name of sustainability (Follows & Jobber, 2000; Tilikidou & Delistavrou, 2014).

Contrary to prior research that claims consumer distrust of environmental claims is a primary impediment for buying green products (Kaufmann, Panni, & Orphanidou, 2012), lack of trust was not named frequently in these surveys. Lastly, availability and display in the supermarkets did not appear to be pervasive obstacles for buying environmentally friendly products– probably because of the large portfolio of green products in the test supermarkets and the elevated attention given to the sustainable items display in the aisles.

TABLE 3
PRODUCT-SPECIFIC PURCHASE BARRIERS FOR SUSTAINABLE HOUSEHOLD PRODUCTS AND FREQUENCY OF MENTIONING

Laundry Detergent		Household Cleaner		Paper Products		Dishwashing Liquids	
Price	50%	Price	42%	Price	46%	Price	45%
Quality	32%	Quality	29%	Familiarity	41%	Familiarity	32%
Familiarity	31%	Familiarity	26%	Information	30%	Information	25%
Information	28%	Information	25%	Convenience	25%	Quality	24%
Convenience	24%	Convenience	22%	Quality	23%	Convenience	21%
Preference	16%	Preference	17%	Availability	18%	Availability	17%
Trust	13%	Availability	15%	Preference	18%	Preference	14%
Availability	13%	Trust	12%	Trust	12%	Trust	12%
Display	6%	Display	7%	Display	5%	Display	9%
Interest	4%	Interest	5%	Other	2%	Interest	3%
Other	4%	Other	1%	Interest	1%	Other	2%
n = 135		n = 146		n = 101		n = 127	

DISCUSSION & CONCLUSION

This paper aimed to contribute to the expanding literature on sustainable consumer behavior by comparing consumers' personal values against their observed purchase behavior and exploring product-specific purchase barriers. One of the unique contributions of this paper is the use of a data set collected by the researchers, at the point of purchase, combining observed behavior with follow-up interviews of the same shoppers.

The data suggests that positive attitudes towards sustainable consumption hardly impact the purchase intentions for sustainable products. This is particularly important, as 71% of consumers state to be willing to pay more for an environmentally responsible product (Cone Communications & Ebiquity, 2015). Yet, these reports seem to be misleading and the focus on personal beliefs seems too narrow, leading to the conclusion that attitude should be discarded as meaningful explanatory variable for both intentions and actual behavior.

The positive and significant effect of subjective norms on purchase intentions indicate the strong role of the social environment on behavior. This may offer an avenue of incentivizing sustainable purchases through comparing the consumers' product choices with that of peers or an ideal-type behavior. Such an approach has proven effective for incentivizing reuse rates of hotel towels (Goldstein, Cialdini, & Griskevicius, 2008), influencing recycling rates (John et al., 2013) or in choosing a sustainable product in online shopping (Demarque, Charalambides, Hilton, & Waroquier, 2015). Note, however, that in our study consumers were surveyed in the public sphere (stores), using face-to-face interviews, which may have created some social pressure, whereas other studies used mail or on-line surveys which consumers could fill at home.

The effect of intention on actual behavior is significant but our model demonstrates that even consumers with extremely high intentions are only about as likely to buy the sustainable version as they are to buy the regular version. This finding highlights the observation that consciously stated intentions still have a limited impact on the actual purchase behavior (Carrigan & Attalla, 2001; M. J. Carrington et al., 2016; Caruana, Carrington, & Chatzidakis, 2016).

In light of these findings, the utility of questionnaires and stated attitudes and intentions in behavioral research regarding sustainability remains debatable. When interviewed face-to-face consumers' response to poll-takers may be skewed by virtue-signaling bias, as consumers try to give answers that make them appear more sophisticated or try to give the answer they think the poll taker wants to hear (Milfont, 2009). This means that managers should not be swayed by verbal expressions on attitude, concerns and intentions, but rather work on the economics, efficacy, and promotions of sustainable alternatives.

Notably, the price of sustainable household products was the most frequently stated purchase barrier. Despite the increasing awareness of climate change and environmental pollution, people's purchase decisions are largely determined by economics. Other hurdles to sustainable purchases include lack of both information and familiarity. These factors can possibly be overcome with more advertisement, free samples, and other marketing initiatives. Furthermore, consumers hesitate to buy the sustainable version of household goods because of perceived quality and efficacy, an obstacle which has long existed, as reported early on by Ottmann (1998). These hurdles too may be overcome with similar marketing initiatives.

This study is one of few to combine real product choice data with interview data from the same individual consumers in a real world setting at the point of product choice. Despite the novel data collection methodology the survey answers may have artificially high values for the TPB measures as consumers might have given socially desirable answers (Andorfer & Liebe, 2012; Hassan et al., 2016). The sample may have also depicted skewed results owing to the small number of low income and low education levels in the sample compared to the general Massachusetts or the U.S. populations. One would expect a more representative sample to show lower rates of sustainable product choice.

Nevertheless, future research may also use end-of-aisle interception-style research interviews regarding product choice since it combines observed purchase behavior with socio-economic and attitudinal data on the same consumers. In addition, one store manager suggested that green product breadth may be an important factor – a study in a larger number of retail outlets may bring out the relevance of such variable.

Moreover, although the number of observations for the structural equation model surpassed the suggested minimum of 200 observations, the model's fit indices are not optimal (Kline, 2011). In addition, it should be noted, that the results of this SEM study have sampling and selection effects based on the limited number of stores and times of data collection available (MacCallum & Austin, 2000;

Raykov, Tomer, & Nesselroade, 1991). Therefore, the generalizability of these results beyond the sample is limited.

The results of this study nonetheless indicate that positive attitudes towards sustainable consumption are poor predictors for intention and that even people with high intentions to purchase sustainable products frequently do not translate this into actual choices. The study was carried out in Massachusetts, one of the most progressive states in the US, and even there, the results were not encouraging. Price, quality and convenience continue to be the most important determinants of product purchase. We therefore follow Carrington's (M. J. Carrington et al., 2016) call for reimagining the attitude-behavior gap and focusing more on investigating the underlying markets and economic systems to bring change at scale.

For example, effective policy variables that may affect product choices will invariably have to use economic factors. Thus, a carbon tax which will increase the costs of non-sustainable products, or subsidies for sustainable products can change the economic incentives. Of course, as the Yellow Vests movement in France (Carattini, Kallbekken, & Orlov, 2019), the 2013 Australian elections (Rootes, 2014), the failure of a carbon tax proposal in Washington State in 2018 (Anzilotti, 2018), the lack of attainment of the Paris accord commitments by most nations, and many other indicators, all illustrate that none of this is easy or even feasible in the near future.

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APPENDIX

SOCIO-DEMOGRAPHIC PROFILE OF THE SAMPLE COMPARED TO THE MASSACHUSETTS POPULATION

Socio-Economic Characteristic	Massachusetts (%)	Sample (%)
Gender		
Female	51%	69%
Male	49%	31%
Age		
18-24	9%	8%
25-34	18%	23%
35-44	16%	17%
45-54	19%	20%
55-64	17%	20%
65+	20%	12%
Race & Ethnicity		
White	73%	70%
Black or African American	7%	9%
Asian or Asian American	6%	10%
Latino/a	11%	7%
Multiple	2%	3%
None of the above / other	1%	1%
Highest level of education		
Less than high school diploma	10%	1%
High school diploma or equivalent (e.g., GED)	25%	11%
Some college or Associate's degree	26%	20%
College degree (e.g., B.A., B.Sc.)	22%	38%
Graduate school degree (e.g., M.Sc., PhD)	16%	29%
Annual household income		
Less than $15,000	10%	1%
$15,000 to $24,999	7%	3%
$25,000 to $34,999	7%	9%
$35,000 to $49,999	10%	8%
$50,000 to $74,999	14%	21%
$75,000 to $99,999	12%	12%
$100,000 to $124,999	10%	10%
$125,000 or more	29%	22%
Prefer not to answer	n/a	14%