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Factors Affecting Sustainable Consumer Behavior in the MENA Region: A Systematic Review

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ABSTRACT

Sustainable consumer behavior (SCB) gained significant attention given the relevance it bears for a broad set of actors. Since most of the relevant literature is rooted in western countries, researchers and policymakers implicitly assume that behaviors in developing countries tend to replicate those in developed countries. This review, based on seventy-one articles published since 2000, questions such assumption by analyzing the empirical research on SCBs in the Middle East and North Africa (MENA), a distinctive region that has been so far overlooked by mainstream research. Results reveal that most MENA-based papers are rooted in traditional frameworks of the rationalistic stream and that environmental values represent a key driver of SCB, while habits and socio-demographics are relegated to a negligible role. This study provides an added value by synthesizing the fragmented evidence on the topic and discussing aspects emerging as peculiar of the MENA and differentiating the latter from other societies.

Introduction

The growing awareness on the unsustainability of current production and consumption patterns led to widespread consensus over the need to promote a shift in the paradigm capable of avoiding the detrimental impacts that current trajectories entail. While the problematic aspects of the dominant paradigm of development have a long history, they reached center-stage attention quite recently as sustainable production and consumption are now acknowledged as a high priority sustainable development goal for countries worldwide (United Nations 2018). Such a shift requires synergic efforts from actors like industrial companies and public organizations, while also individual citizens are asked to play a prominent role in their daily activities (Caruana and Chatzidakis 2014; Sen, Du, and Bhattacharya 2016). SCB represents the object of a broad and wealthy literature which is by nature interdisciplinary, encompassing studies in the fields of marketing, management, psychology, and sociology (Lanzini 2018), with the relevance on the topic being mirrored by the number of editorial essays (Carrington et al. 2020) and special issues (Ruby, Walker, and Watkins 2020) that journals devote to it.

The present paper analyses SCB in the MENA region, where the consequences of unsustainable behavioral patterns (of which purchase/consumption represents only a single although relevant example) might get exacerbated by the fact that developing countries are currently facing fast rates of development and urbanization, with environmental issues often relegated to the background: "[g]overnmental policies in these economies tend to develop the economy and feed the hungry, rather than consider environmental performance" (Wang et al. 2019, p. 748). Furthermore, the region is hindered by natural constraints, political instability and subsequent financial burdens (Issa and Al Abbar 2015), which represent a distinctive institutional setting that may either facilitate or hinder sustainable consumption.

In parallel, while consumers in western societies have acknowledged and recognized the relevance of the impacts of their behaviors on the environment, consumers in the MENA region are still at the infancy stage of environmental awareness (Khosravi, Jha-Thakur, and Fischer 2019; Mostafa 2006). This discrepancy is also mirrored by the academic world. On the one hand, the need for a cross-cultural approach to the topic is not new, as almost twenty years ago Chan and Lao stressed how "despite the fact that most of the behavioral theories have been developed and tested in western countries, and particularly in the US, relatively little attention has been devoted to investigating their validity in other cultural settings" (Chan and Lau 2002, p. 11). On the other hand, there is still an imbalance in the cultural/geographical representativeness of SCB studies, since "an overwhelming proportion of research continues to be restricted to European and North American consumers. Clearly, a more globally representative understanding of consumer responses to CSR [Corporate Social Responsibility] is called for" (Sen, Du, and Bhattacharya 2016, p. 73).

The predominance of western-based literature, however, should not overshadow the growing literature now available on SCB in emerging economies. Indeed, the interest in the influence of culture on consumer behavior has recently increased, spurred by the globalization of markets and diversification of consumer segments (Douglas and Craig 1997; Scalco et al. 2017). It is indeed reasonable to assume that individual behaviors are guided also by culture-specific factors, so that employing a cultural lens might promote a better understanding of sustainable behaviors and their determinants (Bamberg and Möser 2007; Minton et al. 2018; Thøgersen 2010): recently, a new stream of research "seeks to develop a more culturally oriented understanding, focusing on themes such as social identities, consumption communities and socio-culture factors that determine the nature and scope of (ethical) consumption" (Chatzidakis, Shaw, and Allen 2018, p. 2).

While evidence from developing countries is mostly atomistic, being either focused on a single country or on a cross-national comparison of two or few countries, the present article provides an added value to the literature since, to the knowledge of the authors, no systematic review on SCB in the MENA region (where consumers share multiple cultural, political, and economic aspects that set them apart from other parts of the world) has been performed. To reach its objective, the paper is organized as follows. First, the main theoretical frameworks on the determinants of SCB are presented (Section theoretical frameworks on SCB). Then, Section an overview on SCB research across cultures is angled toward the cross-cultural dimension of SCB, adopting a cultural lens to analyze SCB research across countries and cultural contexts. The methodology for the systematic review is described in Section Methodology, which illustrates the search strategy, the selection criteria and how relevant information has been extracted from included articles and organized for the results' discussion. Section Results is devoted to the description of results emerging from the review of MENA literature. To this end, it has been divided in four subsections focusing on sociodemographic and psychographic variables (5.1), habits and past behavior (5.2), planned behavior (5.3) and altruistic/environmental variables (5.4), respectively. Section Conclusions and future steps is devoted to concluding remarks and to the identification of avenues for future research. With this respect, a guiding framework to be adopted for future studies on the topic is proposed: the framework integrates different predictors from mainstream models into one single coherent framework, with a specific angle toward MENA specificities and cultural factors.

Theoretical frameworks on SCB

SCB represents a complex and elusive concept, as many different labels have been proposed in literature, according to the specific perspective of analysis; to the end of this paper, SCB is operationalized as a behavior that improves social and environmental performances as well as consumer well-being (Belz and Peattie 2009). A diversity of models and a large variety of variables are considered to have an impact on consumers' sustainable decisions. These can be broadly divided into

two main streams: one focusing on a rational and aware cognitive process (which can, in turn, be triggered by either egoistic or altruistic motives) and one focusing on the automatic repetition of behaviors and the development of habits (Abrahamse 2019; Lanzini 2018).

With regard to the cognitive stream, the Theory of Reasoned Action (TRA: Fishbein and Ajzen 1975) assumes that intentions represent the main predictor of actual behaviors, and have in turn attitudes and subjective norms as antecedents: while the former represent the general predisposition toward a behavior, the latter are expression of the perceived social pressure. The Theory of Planned Behavior (TPB, Ajzen 1985, 1991) adds perceived behavioral control[1] (PBC) as a third antecedent of behavioral intentions, overcoming the simplistic assumption that behaviors are always under volitional control. According to Norm-Activation Model (NAM: Schwartz and Howard 1981), personal norms are the key antecedent of behaviors. Personal norms are feelings of moral obligation toward (not) performing an (un)sustainable activity and get activated by awareness of consequences (of not adopting the virtuous behavior) and ascription of responsibility for such detrimental consequences. Connected to NAM is Value-Belief-Norm Theory (VBN, Stern et al. 1999), which again postulates that personal norms are the most prevalent predictor of behavior. The latter is a conjunction of three attitudinal factors (namely values, beliefs, and personal norms), and is driven through a chain of causally related variables: values, worldview, awareness of consequences, ascription of responsibility, and personal norms.

A second stream of research stems from the assumption that behaviors can be at times triggered by an automatic response to a familiar situation, rather than by rational evaluations of available alternatives (Verplanken and Aarts 1999). Habits can be described as a form of goal-directed behavior: that is, as links between a goal and actions that are instrumental in attaining this goal (Aarts and Dijksterhuis 2000). When genuine habits develop, cognitive evaluation of alternatives gets deactivated, and the process is facilitated by conditions, such as frequent repetition, goal-directed automaticity, and stable contexts.

It is plausible to assume that, indeed, both rational evaluations and automatic responses to familiar situations can play a role in shaping behavioral trajectories, with either of the two assuming a predominant role according to the specific individual, behavior and situation at hand. Consistently with this assumption, different theoretical frameworks have been proposed in literature, such as the Theory of Interpersonal Behavior (TIB, Triandis 1977), Attitude-Behavior-Context Theory (ABC, Stern 2000), or the Comprehensive Action Determination Model (CADM, Klöckner and Blöbaum 2010).

An overview on SCB research across cultures

While the review represents a novelty for the MENA region, there are in literature meta-analyses and systematic reviews focusing on different geographical and cultural contexts. Most of these are based (almost) exclusively on western countries (e.g., Schanes, Dobernig, and Gözet 2018), yet there are studies that include also evidence from developing countries, adopting a cross-cultural lens enabling an analysis of the role of cultural and socio-economic context in shaping behavioral patterns in the domain of sustainability. Such works have been performed with reference both to sustainable behaviors in general (Morren and Grinstein 2016; Papaoikonomou, Ryan, and Valverde 2011) and to specific behavioral domains, ranging from mobility (Lanzini and Khan 2017) to purchasing of green products (Scalco et al. 2017), and recycling (Miafodzyeva and Brandt 2013).

Morren and Grinstein (2016) performed a meta-analysis on sixty-six studies from twenty-eight (both developed and developing) countries, testing within the TPB framework the moderating effect of variables such as economic development and national culture. Their analysis confirms the effectiveness of planned behavior constructs for the investigation of SCB, yet highlight the key-role exerted by the cultural context, as "pro-social behavior, and specifically environmental behavior varies considerably across countries and national cultures when accounting for the TPB

framework" (Morren and Grinstein 2016, p. 92). For instance, the meta-analysis suggests that there is a broader intention-behavior gap in developing countries, perhaps because of a lack of opportunities to act consistently with pro-social or pro-environmental intentions (e.g., availability of green products in the stores). As a consequence, there is a lower correlation between behavioral intentions and PBC, as people feel less empowered to be sustainable.

Papaoikonomou, Ryan, and Valverde (2011) performed a systematic literature review on empirical studies on SCB. Although the overwhelming majority of the eighty contributions is based either in the US or Europe, some of the papers included in the review are from developing countries such as Turkey, Egypt or India. TPB is confirmed as the most influential framework, although integrations to the original formulation (e.g., inclusion of moral concerns) are common and useful in increasing the predictive capability. The authors stress how future research should be focusing on the role of the social and cultural context, which has been overlooked by the vast majority of literature on SCB whereas "[t]he cultural context (…) is important because it shapes ethical beliefs and moral values" (Papaoikonomou, Ryan, and Valverde 2011, p. 214).

Lanzini and Khan (2017) performed a meta-analysis on the psychological and behavioral determinants of modal choice. TPB and NAM emerge as the key theoretical frameworks adopted in studies in the mobility domain, while also habits are analyzed in a considerable number of studies, probably given the fact that most commuting trips represent a repetitive behavior, on the same route and in a stable context. Most included studies focused on samples from developed countries, with the notable exception of Taiwan (two studies out of fifty-eight), and sample country did not emerge as significant in the moderator analysis performed to gain insights on the high heterogeneity of results.

In a meta-analysis on the purchase of green products, Scalco et al. (2017) analyze seventeen studies adopting the TPB framework, based on samples from heterogeneous geographical contexts and cultural backgrounds. Two out of three samples from developing countries (India and Iran) are those showing the weakest correlation

between subjective norms and the intention to purchase organic food. Further, consistently with Morren and Grinstein (2016) the link between PBC and behavioral intentions is weaker in developing countries.

Miafodzyeva and Brandt (2013) performed a meta-analysis on recycling behaviors, analyzing sixty-three studies from seventeen countries including Uganda, Mexico, Bangladesh, Hong Kong and Korea. According to the results, moral norms and environmental concern emerge as key behavioral determinants, while socio-demographic factors play only a marginal role, although religious identity (Kurz, Linden, and Sheehy 2007) might in some cases be relevant.

Methodology

This paper adopted the approach of Tranfield, Denyer, and Smart (2003) in conducting the systematic review aimed at identifying the factors that influence SCB in MENA countries.

Search strategy

The strategy consisted of searching for relevant studies in the scientific literature, focusing on behavioral domains that are considered by most literature as relevant from a sustainability standpoint (Thøgersen and Ölander 2003). The search strings[2] were based on the combination of (SCBs (X) AND MENA countries (X)). The different SCBs and MENA countries were inserted into X, one at a time, surfing six research databases and search engines: Scopus, ScienceDirect, EBSCO, Egyptian Knowledge Bank, Masader–Oman Virtual Science Library and Google Scholar. However, in order to make sure all relevant articles were included, a supplementary strategy was adopted and consisted of a) cross-reference search of all collected articles, b) hand searching in social platforms including Academia and Research Gate, and c) contacting the researcher in case full text was not available online.

Selection criteria

Selection criteria required that papers had to a) focus on the determinants of SCB, b) be

conducted in one of MENA countries[3], and c) be published in 2000 or later. More in detail, articles have been initially selected if the search terms appeared in the topic section of the database or in the keywords, title or abstract of the article. Then, manual analysis of each paper has been performed to identify whether it actually focused on the topic being investigated, and whether it matched the quality standards, using journal ranking as an indicator or manually in case of papers published in regional journals with no impact factor. Of the 5,786 articles selected, seventy-one could be retained based on the aforementioned criteria, and represent the sample of the review (n = 71). Each study in the final sample is indexed in Table 1.

Analysis

To synthesize this literature, we analyzed the content of the sampled studies, retrieving and tabulating from each article: study profile (i.e., year, author(s), journal, study objectives, theoretical background, setting, and sample specifications, data collection tools, outcome variable, determinants of the outcome variable, and other key findings relevant to the review.

Stemming from the objectives of this study, papers were grouped in terms of the outcome variable (e.g., waste reduction, green purchase) and the direct antecedents of this outcome variable. Then, the most prominent variables in the MENA countries were identified and mirrored in relation to the key theoretical frameworks to highlight (in)consistencies with mainstream literature.

The increase in the number of publications in the analyzed period has been substantial over the last five years, with researchers beginning to show interest in the topic. SCB research in MENA countries is unevenly distributed: while the majority of SCB studies were conducted in Iran (twenty-six papers), followed by Egypt and Lebanon (nine papers each), six out of the eighteen sampled countries had no publications at all.

Sample studies were grouped into five behavioral categories based on the outcome variable. The single most studied behavior is green purchase, followed by generic sustainable behaviors, organic food, energy savings, and waste

management/recycling. The "others" category includes a heterogeneous set of behavioral domains which have received very little attention so far yet are likely to assume increasing relevance in future years (e.g., sustainable mobility).

Results

The present section illustrates in detail the results of the review. Table 1 lists all papers included in the latter, describing main features, such as sample details (size, type, and geographical location), behaviors being investigated (i.e., the outcome variable), variables that are supposed to be their antecedents (i.e., the predictors) and the relationship found which can be positive, negative, or not significant. Table 2, on the other hand, illustrates the main predictors (listed in order of prevalence in the sample), detailing for each one of them how many studies found a positive, negative or not significant relationship with the outcome variables, respectively.

This section is organized as to illustrate results referring to (1) socio-demographics and psychographic variables; (2) habits and past behavior; (3) planned behavior variables and (4) altruistic and environmental variables.

Socio-demographics and psychographic variables

Socio-demographic variables have been object of most early studies on SCB and are present in relevant numbers also in the dataset pertaining to MENA countries. Consistently with prior evidence in literature (Diamantopoulos et al. 2003; Lanzini 2018), socio-demographic variables do not emerge as good predictors of sustainable behaviors: there is indeed no consensus on the effects of GEIA (gender, education, income, and age) on SCBs.

The demographic variable that received most attention is represented by gender, which is consistent with the speculation that in male-empowered societies such as MENA countries it could play a relevant role. Gender is analyzed in twenty-four studies of the sample and appears to be a significant behavioral antecedent in twelve of these; yet, there is no agreement whether it is men or women that show virtuous behavioral patterns. Although a prevalence of studies

Table 1. Sample studies – key figures.

#	Article	Sample size, type, Country	Outcome variable[5]	Predictors
1	Aktas et al. (2018)	277 consumers, convenience, Qatar	**Waste/recycling**[6]	*Attitude (+),* Food surplus (+), Lack of perceived behavioral control (+), Ramadan (+), *Subjective norm (+),* Intention (-), *Lack of perceived behavioral control (-).*
2	Abdelradi (2018)	1000 consumers, convenience, Egypt	Waste/recycling	Food choice (healthy and safety) (+), Materialism (+), Waste minimization (+), Waste recycling (-), Environmental awareness (n.s), Food expenditure (n.s), Personality (n.s).
3	Babaei et al. (2015)	2400 householders, random, Iran	Waste/recycling	Age (+), Education (+), Gender (+), Occupation (+).
4	Mattar et al. (2018)	1264 interviews + 250 dairy sheets of consumers, convenience, Lebanon	Waste/recycling	Area (rural vs. urban) (+), Education (+), Feeling guilty when throw food away (+), Incentives (+), Prepare different dishes each day (+), Think of ways to use leftovers (+), Buy special offers (-), Eating out (-), Employment status (-), Family size (-).
5	Pakpour et al. (2014)	1782 households, random, Iran	**Waste/recycling**	Action planning (+), Attitude (+), Age (+), Gender (+), Intention (+), Moral obligation (+), Past behavior (+), PBC (+), Self-identity (+), Subjective norms (+), Education (n.s).
6	Asif et al. (2018)	220 consumers, convenience, Iran	*Organic food/products*	Attitude (+), Environmental awareness (+), Environmental concern (+), Health consciousness (+), Subjective norm (+), PBC (n.s).
7	Bagher, Salati, and Ghaffari (2018)	215 consumers, random, Iran	*Organic food/products*	Attitude (+), Environmental concern (+), Environmental knowledge (+), Ethical orientation (+), Health awareness (+), Health lifestyle (+), PBC (+), Subjective norm (+).
8	Charbaji and Hayek (2003)	203 students, purposeful, Lebanon.	Organic food/products	Education (+), Environmental concern (+), Gender (+), Health concern (+), Animal welfare (n.s), Governmental standards (n.s).
9	Haghjou et al. (2013)	423 consumers, convenience, Iran	*Organic food/products*	Attitude (+), Environmental knowledge (+), Food-born risk perception (+), General shopping criteria (+), Gender (+), Marital status (+), Family size (+), Income (+), Age (n.s), Education (n.s).
10	Minbashrazgah, Maleki, and Torabi (2017)	282 consumers, random, Iran	**Organic food/products**	Intention (+), *Organic food belief (+), Perceived environmental responsibility (+), Trust (+),* Price transparency (-), *Subjective norm (n.s).*
11	Mohamed, Chymis, and Shelaby (2012)	200 mixed, convenience, Egypt	Organic food/products	Age (+), Income (+), Education (n.s), Gender (n.s), Number of children (n.s).
12	Muhammad, Fathelrahman, and Ullah (2015)	300 consumers, random, UAE	*Organic food/products*	Age (+), Education (+), Household Size (+), Income (+), Nationality (+), Environmental awareness (n.s), Employment status (n.s.), Gender (n.s).
13	Nedra, Sharma, and Dakhli (2015)	350 consumers, convenience, Tunisia	Organic food/products	Environmental concern (+), Health concern (+), Implication (+), Intention (+), Attitude (n.s).
14	Rahnama (2017)	483 female consumers, convenience, Iran	Organic food/products	Conditional value (+), Epistemic value (+), Functional value (+), Health value (+), Environmental value (n.s), Emotional value (n.s), Social value (n.s),
15	Sadati and Mohammadi (2012)	174 consumers, convenience, Iran	*Organic food/products*	Attitude (+), PBC (+), Subjective norm (+).
16	Saleki, Seyedeh, and Rahimi (2012)	150 consumers, random, Iran	Organic food/products	Attitude (+), Environmental knowledge (+), Subjective norm (n.s).
17	Yazdanpanah and Forouzani (2015)	389 students, stratified random sampling, Iran	Organic food/products	Area (urban vs. rural) (+), Attitude (+), Gender (+), Moral norms (+), Self-identity (+), PBC (n.s), Subjective norms (n.s).
18	Yazdanpanah, Forouzani, et al. (2015)	389 students, stratified random, Iran.	Organic food/products	Area (urban vs. rural) (+), Gender (+), General health orientation (+), Perceived benefits (+), Self-efficacy (+), Perceived barriers (-), Cues to action (n.s), Education (n.s), Perceived severity (n.s), Perceived susceptibility (n.s).
19	Zarei and Maleki (2018)	313 consumers, -, Iran	**Organic food/products**	*Attitude (+), Corporate ability (+),* Information seeking (+), Intention (+), *Environmental knowledge (n.s),* **Green skepticism (n.s).**
20	Almossawi (2014)	243 students, Convenience, Bahrain	Green purchase	Attitude (+), Environmental concern (+), Environmental knowledge (+).
21	Al-Otoum and Nimri (2015)	342 consumers, convenience, Jordan	Green purchase	Education (+), Environmental awareness (+), Income (+), Trust (+), Age (n.s).
22	Attia (2014)	89 students, convenience, Egypt	*Green purchase*	Attitude (+), Green advertising (+).
23	Attia and Farrag (2017)	138 consumers, random, Egypt	Green purchase	Consumer lifestyle (+), Consumer values (-), Age (n.s), Education (n.s), Gender (n.s), Income (n.s).

Table 1. Continued.

#	Article	Sample size, type, Country	Outcome variable[5]	Predictors
24	Dagher and Itani (2014)	101 consumers, Convenience, Lebanon	Green purchase	Concern for self-image (+), Perceived environmental responsibility (+), Perceived seriousness of environmental problems (+), Perceived effectiveness of environmental behavior (n.s.).
25	Dagher, Itani, and Kassar (2015)	326 consumers, -, Lebanon	Green purchase	Attitude (+), Environmental concern (+), Gender (+).
26	Dehghanan and Bakhshandeh (2014)	412 consumers, convenience, Iran	**Green purchase**	Intention (+), *Green trust (+), Green perceived value (+), Green perceived risk (-)*.
27	Esmaeilpour and Bahmiary (2017)	315 consumers, convenience, Iran.	Green purchase	Attitude (+), Care for green products (+), Environmental concern (+).
28	Grace and Omar (2012)	101 consumers, -, Lebanon.	Green purchase	Environmental concern (+), Social influence (+), Attitude (-).
29	Ibrahim and Al-Ajlouni (2018)	471 students, convenience, Saudi Arabia	*Green purchase*	Perceived response-efficacy (+), Perceived self-efficacy (+), Perceived severity (+), Perceived vulnerability (+), Moral accountability (+), Moral obligation (+), Moral outrage (+), Construal level (+), Perceived costs (n.s.), Rewards (n.s.).
30	Khorshidi, Gholizadeh, and Naghash (2014)	272 consumers, random, Iran	Green purchase	General environmental opinions (+), Perceived quality (+), Age (n.s), Gender (n.s).
31	Mobrezi and Khoshtinat (2016)	279, Female Consumers, -, Iran	*Green purchase*	Attitude (+), Environmental concern (+), Subjective norm (+), Personal self-image (n.s), Social impacts (n.s.).
32	Mostafa (2006)	1093 students, Convenience, Egypt	*Green purchase*	Altruism (+), Attitude (+), Environmental concern (+), Environmental knowledge (+), Perceived consumer effectiveness (+), Age (-), Gender (-), Skepticisim toward environmental claims (-), Education (n.s.).
33	Mostafa (2007)	1093 students, convenience, Egypt	**Green purchase**	*Attitude (+)*, Intention (+).
34	Mostafa (2009)	418 consumers, convenience, Kuwait	*Green purchase*	Altruism (+), Attitude (+), Environmental concern (+), Environmental knowledge (+), Skepticism toward environmental claims (-).
35	Mourad and Serag Eldin Ahmed (2012)	302 consumers, convenience, Egypt	Green purchase	Green brand image (+), Satisfaction (+), Trust (+), Age (-), Education (-), Income (-), Gender (n.s), Green awareness (n.s).
36	Nejati, Salamzadeh, and Salamzadeh (2011)	274 students, convenience, Iran	**Green purchase**	Intention (+), *Subjective norm (+), Attitude (n.s)*.
37	Rahnama and Rajabpour (2017)	700 consumers, convenience, Iran	Green purchase	Environmental value (+), Epistemic value (+), Functional value (+), Social value (+), Emotional value (n.s), Conditional value (n.s).
38	Siyavooshi, Foroozanfar, and Sharifi (2019)	270 consumers, nonrandom assignment, Iran	*Green purchase*	Awareness of religious duties (+), Environmental knowledge (+).
39	Vazifehdoust et al. (2013)	374 consumers, convenience, Iran	**Green purchase**	*Attitude* (+)*, Intention (+). (*Environmental concern, among others, has indirect effect through attitude).
40	Zare, Bagheri, and Moein (2016)	180 students, stratified random, Iran	**Green purchase**	*Attitude (+)*, **Environmental concern (+)**, Intention (+), **Liberalism (+), Perceived consumer effectiveness (+)**, *Willingness to pay (+)*.
41	Zu'bi et al. (2015)	250 consumers, convenience, Jordon	*Green purchase*	Eco-labelling (+), Education (+), Gender (+), Green perceived value (+), Income (+), Trust (+), Green perceived risk (-), Age (n.s).
42	Abdul-Muhmin (2007)	232 consumers, Convenience, Saudi Arabia	*Generic sustainable behavior*	Perceived psychological consequences (+), Environmental concern (n.s).
43	Akermi and Smaoui (2016)	14 interviews + 275 surveys with consumers, Quota sampling, Tunisia	Generic sustainable behavior	Spiritual Religiosity (+), Collectivism (mx), Long term orientation (mx).
44	Alsmadi (2007)	303 students, convenience, Jordan	Generic sustainable behavior	Income (-), Gender (n.s).
45	Bhuian et al. (2018)	306 consumers, Convenience, Oman.	Generic sustainable behavior	Attitude (+), Environmental concern (+), Environmental knowledge (+), Environmental value (+), Religiosity (+).
46	Kalantari and Asadi (2010)	1200 consumers, stratified random, Iran	Generic sustainable behavior	Attitude (+), Environmental knowledge (+), Environmental legislation (+), Feeling of stress (+), Preparedness to act (+).
47	Khan and Trivedi (2015)	115 consumers, -, UAE	Generic sustainable behavior	Gender (+).
48	Makki, Abd-El-Khalick, and BouJaoude (2003)	660 students, stratified sampling, Lebanon.	**Generic sustainable behavior**	**Affect (+), Attitude (+)**, Intention (+).
49	Mkik, Khouilid, and Aomari (2017)	202 consumers, convenience, Morocco	Generic sustainable behavior	Environmental awareness (+), Green advertising (+), Age (n.s), Education (n.s), Gender (n.s),
50	Nassani et al. (2013)	364 Consumers, -, Saudi Arabia	Generic sustainable behavior	Consumer Environmental Activism (+).
51	Oweini and Houri (2006)	255 students, convenience, Lebanon	**Generic sustainable behavior**	**Gender** (+), **Frequency of hiking** (+), **Age** (n.s), **Living abroad** (n.s), **Major** (n.s).

(continued)

Table 1. Continued.

#	Article	Sample size, type, Country	Outcome variable[5]	Predictors
52	Rice (2006)	330 mixed, Convenience, Egypt	Generic sustainable behavior	Family size (+), Marital status (+), Negative consequences (+), Occupation (+), Personal responsibility (+), Religiosity (+), Self-efficacy (+), Age (n.s), Gender (n.s), Education (mx), Conservation values (mx), Openness to Change (mx), Self-enhancement values (mx), Self-transcendent values (mx).
53	Sharif (2016)	7 experts + 243 mixed, convenience, Qatar.	Generic sustainable behavior	Consumption ethics (+), Environmentalism (+), Fair trade attitude (+), Materialism (n.s).
54	Tamer (2011)	241 students, convenience, Bahrain	Generic sustainable behavior	Education (+), Environmental concern (+), Income (+), Liberalism (+), Perceived consumer effectiveness (+), Age (-), Gender (n.s).
55	Yaghi and Alibeli (2017)	1282 consumers, random, UAE	*Generic sustainable behavior*	Attitude (+), Environmental knowledge (+), Education (+), Mother's education (+), Moral values (+), Social dilemma (-), Age (n.s), Father's education (n.s), Gender (n.s), Income (n.s).
56	Ibrahim and Al-Ajlouni (2018)	1350 students, convenience, UAE	Water	Emotion (+), Habits (+), Awareness/knowledge (+), Attitude (+), Social norms (+), Facilitating factors (+), Religiosity (+).
57	Wells et al. (2016)	447 consumers (Employees)/ purpose-ul, Iran	Energy& water	Attitude (+), Generativity (+), Age (n.s), Gender (n.s).
58	Akroush et al. (2019)9	474 consumers, non-probability (convenience and quota), Jordan	*Energy*	Attitude (+), Environmental awareness (+), Perceived benefits (+).
59	Azar and Al Ansari (2017)	333 consumers, convenience, UAE	**Energy**	Discussion of energy conservation with work colleagues (+), **Incentives (+), Knowledge (+),** *Level of control (+),* Motivation e.g., cost reductions (+), Pro-environmental communication at home (+), Willingness to save energy (+), *Motivation e.g., pollution reduction (-),* Nationality (-), **Occupation (-),** Pro-environmental communication at work (-), **Age (n.s).**
60	Düştegör et al. (2018)	228 Households, convenience, Saudi Arabia.	*Energy*	Environmental knowledge (+), Past experience (+), Perceived benefits (+), Perceived self-effectiveness (+), Environmental awareness (n.s), Social interaction (n.s.).
61	Elmustapha, Hoppe, and Bressers (2018)	200 consumers, convenience, Lebanon	Energy	Consumer novelty seeking (+), Observability (+), Relative advantage (+), Total independent judgment making (+), Compatibility (n.s), Complexity (n.s), Risk (n.s.), Financial Incentives (n.s.), Personal norms (n.s.), Subjective norms (n.s.),
62	Nahiduzzaman et al. (2018)	88 households, random, Saudi Arabia.	Energy	Building area (n.s), Education (n.s), Environmental awareness (n.s), Family size (n.s), Female proportion (n.s), Proportion of adults (n.s), Quality of life (n.s).
63	Rezaei and Ghofranfarid (2018)	280 households, multistage sampling, Iran	*Energy*	Attitude (+), Environmental awareness (+), Moral norms (+). Relative advantage (+), PBC (+), Subjective norms (n.s).
64	Yazdanpanah, Komendantova, et al. (2015)	260 students, random, Iran.	*Energy*	Environmental concern (+), Perceived benefits (+), Self-efficacy (+), Cues to action (n.s), General concern (n.s), Perceived barriers (n.s), Perceived severity (n.s), Perceived susceptibility (n.s).
65	Al-Thawadi (2018)	30 students for experiment + 300 questionnaire, non-probability, Bahrain.	*Algal consumption*	Food neo-phobia (+), Perceived risk and uncertainty (+), Subjective norm (+).
66	Mahadin (2018)	333 consumers, random, Jordan	Green Mobility	Eco-Friendliness (+), Current trend (+), Fuel consumption efficiency (+), Technological Features (+), Agreeing to switch (-), Battery life (-), Fear of technology (-), Lack of Information (-), Limited choice of vehicles (-), Lower Taxes (+), Overwhelming Trend (-), Price (n.s).
67	Michel, Nancy, and Atef (2014)	296 consumers, non-probability, Lebanon	*Green mobile telecommunication*	Attitude (+), PBC (+), Subjective norm (+).
68	Dezdar (2017)	633 students, convenience, Iran.	**Green information technology**	*Attitude (+), Consideration of future consequences (+), Intention (+), Openness to experience (+), PBC (+), Subjective norm (+).*
69	Mostafa (2016)	1212 consumers, Convenience, Egypt.	*WTP premium for carbon-labelled products*	Gender (+), Income (+), Age (-), Education (-).
70	Mostafa and Al-Hamdi (2016)	246 consumers, convenience, Kuwait	WTP for *Environmental protection (leisure)*	Income (+), Price (-), Age (n.s), Education (n.s), Gender (n.s).
71	Baqer (2012)	251 students, convenience, Kuwait	*Willingness to share environmental responsibility*	Business support (+), Environmental concern (+), Environmental consciousness (+), Government support (+), Locus of control (+), Media (+), Spiritual beliefs (+), Skepticism (n.s).

Table 2. MENA prominent SCB predictors.

Main predictors*	# of studies (Effect)	Relevant theories
Attitudes	29 (+), 1 (-), 2 (n.s)	TPB
Gender	12 (sig.), 12 (n.s)	Socio-demographics
Age	4 (+), 4 (-), 12 (n.s)	Socio-demographics
Education	8 (+), 2 (-), 1 (mx), 9 (n.s)	Socio-demographics
Subjective norms/social influence	12 (+), 6 (n.s)	TPB
Environmental concern	16 (+), 1 (n.s)	VBN
PBC/self-efficacy	12 (+), 2 (n.s)	TPB/ Health Belief Model
Intentions	12 (+), 1 (-)	TPB
Environmental knowledge	11 (+), 1(n.s)	NAM/VBN
Income	8 (+), 2 (-), 2 (n.s)	Socio-demographics
Environmental awareness	6 (+), 5 (n.s)	NAM/VBN
Perceived consumer effectiveness	5 (+), 1 (n.s)	TPB
Personal/moral norms	5 (+), 1 (n.s)	NAM/VBN
Trust	5 (+)	Psychographics
Religiosity	6 (+)	Socio-demographics
Family size	3 (+), 1 (-), 1 (n.s)	Socio-demographics
Awareness of consequences	4 (+)	NAM/VBN
Environmental responsibility	4 (+)	NAM/VBN
Perceived benefits	4 (+)	Health Belief Model
Anticipated affect/emosions	4 (+), 1 (-)	Theory of interpersonal behavior
Skepticism to environmental claims	2 (-), 2 (n.s)	Psychographics
Self-identity/image	3 (+), 1 (n.s)	Psychographics

*The table lists predictors that were present in at least 4 studies.

supports the idea that women are more oriented toward sustainable behaviors compared to men, evidence is not conclusive insofar, for instance, men show stronger inclinations toward organic purchasing compared to women (Mohamed, Chymis, and Shelaby 2012). According to Socialization Theory (Beutel and Marini 1995) women have a stronger ethic to care and are more concerned, as differences between genders can be attributed to what is expected from each of them based on the cultural context. This theory can explain the higher inclination of MENA women toward green purchase insofar, in predominantly male-empowered societies, women are deeply involved in taking care of children and family members. Further, women play an important role in the household level compared to men (Mobrezi and Khoshtinat 2016) and such role identity positions them as the main target group for certain SCBs such as household waste management, source separation and recycling (Babaei et al. 2015). However, women should not be the only targets for sustainable markets, since men are often considered as the head of the households, and hence play an integral role in purchasing decisions. From a cultural lens, this sounds reasonable due to the fact that, on the one hand, not many women work so they are not financially independent and, on the other hand, there is still a predominant mentality where men sometimes decide what women should purchase when shopping (Mohamed, Chymis, and Shelaby 2012). These traditional household roles seem to be more dynamic in other developing countries where women are increasingly gaining higher incomes. In Malaysia, for example, Kusago and Barham (2001) find that women show higher financial power than men at the household level. Yet, consistently with the MENA findings, Abdullah Yusof and Duasa (2010) reveal that Malaysian women usually make final decisions regarding everyday household expenditures, while large household expenditures are still made by men. This provides a more nuanced view of the role of gender in sustainable decisions where the nature or amount of expenditure is also relevant.

A second demographic variable for which the MENA sample reaches inconclusive results is represented by age. While some argue that older generations are more likely to assume responsible behaviors (due to experience, wisdom, etc.), others suggest that young people have grown exposed to messages and public discourse focusing on sustainability-related issues, so that it is reasonable to expect them to show more attention to such issues in their daily behaviors. Twelve out of twenty studies analyzing age find no significant relationship with SCB while, of the eight that do so, four suggest that young people are keener toward SCB and four reach the opposite result.

Of the twenty studies reporting the impact of education on consumers' sustainable intention and/or behavior, eight find a significant positive impact as to signal that individuals with higher educational levels show more favorable intentions toward sustainable behaviors. But the relationship is far from clear, as nine studies find no significant effect of education, and three studies find either mixed or negative effects. Interestingly, an Egypt-based study by Rice (2006) finds that education is significantly related to activist and public sphere SCB, while not related to private sphere SCB. The implication that the impact of education varies considerably across behaviors is consistent with literature on other developing countries, showing similar inconsistencies. In China, for example, Wu, Zhou, and Song (2016) found a positive link between education and citizens' persuasion behavior, but a negative link with consumption management behavior.

The pattern is partially clearer for income, as eight studies out of twelve support a positive impact of the latter on consumer sustainable intentions and/or behavior. Consumers with higher income levels are thought to show high green purchase intentions, and this may be due to their ability to afford the premium price that green products typically entail (Mohamed, Chymis, and Shelaby 2012; Mostafa 2016). Agreement is however not general, as Mourad and Serag Eldin Ahmed (2012), for instance, found a negative relationship between income and green brand preference. Morren and Grinstein (2016, p.102) argue that "people in countries with a high human development level also act more environmentally." Thus, they suggest that aspects of human development, such as better income, education, and health, can be relevant to environmental behaviors across borders.

Yet, compared to Franzen and Vogl (2013) conclusion that GEIA variables appeared to be relevant across countries, there is insufficient evidence indicating that these socio-demographic variables show consistent patterns across behaviors.

One aspect that emerges as peculiar of studies in the MENA region is the role played by religiosity, a factor that is often overlooked by mainstream research in other socio-cultural environments. Religiosity refers to the individuals' level of commitment to behave following God's rules (McDaniel and Burnett 1990), and seems to play an influential role behind virtuous behaviors, as all six studies in the sample focusing on it show a positive correlation. The emergence of religiosity as a MENA-relevant determinant sounds justifiable due to the context under investigation, which calls consumers to consider the consequences of their action on other species and the environment in general. Indeed, Mostafa (2016) argues that in a predominantly Islamic nation, consumers are expected to be willing to sacrifice to protect the environment, since religiosity reflects a fundamental belief system with many religious orders about respecting nature and the environment. The Holy Quran states, for example, that "… eat and drink, and do not waste. God does not love the wasteful" (Qur'an 7:31).

While arguably religiosity can influence the consumers conceptions toward sustainable behaviors in the region object of analysis, there is no universal agreement on whether such influence is moderating, indirect or direct. Results from the review support the moderating role of religiosity (Bhuian et al. 2018), while Abdelradi (2018) argues that religious beliefs play an indirect role on SCBs (i.e., food waste reduction) through influencing environmental awareness. This in coherent with the TPB logic where religion is considered as a background factor (Ajzen 1991). On the other hand, another stream of research supports the direct link between religiosity and pro-environmental intentions and behaviors (Rice 2006; Siyavooshi, Foroozanfar, and Sharifi 2019).

Religiosity is likely to be associated with SCB with reference to most religions, given the universality of the message about the responsibility of men toward the natural world (Bhuian et al. 2018). However, the relevance of religiosity as behavioral antecedent in MENA countries is not matched in different geographical and cultural contexts: this could be linked to the key role that religion has in the region, compared for instance to western countries which appear more secularized. Little is available in literature to investigate the role of religiosity in different cultural contexts, as most of the research on religiosity analyses differences in SCBs between religious and not religious people, while evidence on the moderating effect of religiosity adopting a cross-cultural lens

in anecdotal. For instance (although focusing on ethical consumer behavior and not specifically on SCB), Schneider, Krieger, and Bayraktar (2011) compare Christian consumers from Germany and Muslim consumers from Turkey, finding that the latter exhibit a stronger connection between ethical consumer behavior and religiosity: Muslims "generally possess more intrinsic religiosity than Christians and reject unethical consumer behavior more than Christians" (Schneider, Krieger, and Bayraktar 2011, p. 328). Further, the authors suggest that this pattern is likely to be even more pronounced for Muslim countries that are not as western-orientated as Turkey (such as most of the MENA region).

Among (mainly psychographic) variables that are less frequently included in analyses as antecedents of SCB, some deserve to be mentioned; it is the case for instance of trust and incentives.

Trust is found to have a significant positive effect on sustainable consumer intention and/or behavior: if consumers believe in the credibility of a specific product/brand, they are far more likely to buy it. Thus, lack of consumer trust in green products acts as a barrier toward green purchase behavior in the MENA region. This result is comparable with other recent reviews that underlined the importance of trust in sustainability contexts (Joshi and Rahman 2015; Tripathi and Singh 2016). As regards incentives, Elmustapha, Hoppe, and Bressers (2018) claim that financial incentives are often used in government policies to persuade householders to invest in renewable energy technology. However, the findings indicate a non-significant correlation between financial incentives and consumer renewable energy adoption in Lebanon. This can be attributed to the difficulty of applying for financial subsidies due to the high number of qualifications required (Elmustapha, Hoppe, and Bressers 2018). On the contrary, Mattar et al. (2018) find a significant impact of incentives on the participation to recycling programs, where monetary incentives have approximately twice the effect compared to getting information about food waste and correct recycling activities. The role of incentives on motivation to adopt SCBs is indeed object of a debate, as there are theoretical frameworks such as Self Determination and Cognitive Evaluation Theories (Deci and Ryan 1985; Ryan and Deci 2000) suggesting that individuals spurred by economic inducements to perform a specific behavior have their motivation hindered, and the so-called locus of causality shifting outwards. The consequence is that, once inducements are interrupted, consumers are more likely to abandon the virtuous behavior.

Habits and past behavior

A surprising result of the review is that, while most of MENA-based papers are rooted in traditional frameworks of the rationalistic stream, habits are relegated to a negligible role. Indeed, there is only scattered evidence about the role they play in determining SCB. One of the few examples is represented by an empirical investigation performed in the UAE, where water conservation habits are included in the TPB framework in order to segment the population as a pre-requisite for the implementation of behavioral change strategies (Ibrahim et al. 2018).

Few more studies focus on the other hand on the role played by past behaviors, though it is worth stressing how these and habits represent two highly correlated yet different constructs which are not synonyms and should not be treated as such: the frequent repetition of a behavior represents a necessary yet not sufficient element for the development of a genuine habit (Verplanken and Aarts 1999). For instance, Pakpour et al. (2014) find that past behavior significantly predicts householders waste behaviors in Iran, while according to Düştegör et al. (2018) consumers' past experience in using energy-saving appliances in Saudi Arabia positively increases their willingness to buy green energy. Further, in a study performed on a sample of Saudi Arabia consumers, Abdul-Muhmin (2007) finds that past environmentally friendly behavior is positively related to perceived psychological consequences, while not directly related to willingness to be environmentally friendly so that it only has an indirect effect on behaviors.

In contrast with the scant evidence available in MENA-based literature, in other socio-cultural contexts the role of habits in shaping SCB has been object of a wealthy stream of research. An

overwhelming majority of such evidence is focused on western countries. For instance, if we focus on the domain of sustainable mobility, Hoffmann et al. (2017) performed a meta-analysis on the determinants of modal choice: of the forty-three studies retained for the analysis (all from developed countries, thirty-six of which European), eleven investigated the role exerted by habits, confirming the strong influence of the latter in shaping behavioral patterns.

If we shift the focus to other developing countries, Issock, Roberts-Lombard, and Mpinganjira (2020) found that habits have a direct effect on recycling behaviors of households in South Africa, while Lanzini, Pinheiro, and Jara (2018) performed an empirical investigation on the determinants of sustainable mobility in the state of Santa Catarina (Brazil), finding that habits outperform TPB variables as behavioral antecedents. Although most studies are consistent with the assumption that habits represent crucial behavioral antecedents in the domain of sustainability, there is also some evidence supporting an alternative view. It is the case for instance of the work of Nguyen, Zhu, and Le (2015) on waste separation in Vietnam, where the role of habits is found to be secondary.

Planned behavior variables

TPB is arguably the most popular framework adopted in literature to investigate SCB. Although under scrutiny for an over-simplification of its original formulation and the persistent observation of the attitude-behavior gap (Liu, Oosterveer, and Spaargaren 2016), TPB has been extensively adopted to investigate a broad range of behavioral domains, including those closely related to sustainability. Although "the TPB is broadly predictive of behavioral intent within and across cultures" (Mancha and Yoder 2015, p. 147)" more insights on how the cultural context affects the salience of the different TPB constructs (attitudes, subjective norms and PBC) is needed. Minton et al. (2018), for instance, performed a cross-cultural exploration of the role played by TPB constructs in shaping behavioral patterns. They argue that some features of the country of origin (e.g., the level of pragmatism) affect the salience of subjective norms and

attitudes: "[t]he cultural origin of a consumer is hypothesized as an antecedent to attitudes, which precedes sustainable behaviors, and the pragmatism in a national culture is hypothesized as moderating sustainable behavior intentions" (Minton et al. 2018, p. 401).

Countries in the MENA region make no exception insofar TPB confirms to be widely adopted in investigating sustainable behaviors. Although the theory itself is not always explicitly mentioned, its components are analyzed by many studies as antecedents of sustainable behaviors (sometimes jointly, sometimes as stand-alone).

Consumers' intention has been investigated intensively in the reviewed papers either as a dependent variable or as a predictor of behavior, and thirteen studies found a significant link between consumers' intention and behavior. This goes in line with the TPB logic, where intention is the best predictor of behavior, and planning is the main carrier of intentions. Further, many studies try to identify the predictors of intentions toward sustainable behavior. Notwithstanding the variability of behaviors analyzed, the main antecedents of individuals sustainable intentions include attitudes, subjective norms and PBC (behavioral antecedents in the original TPB framework) but also trust, knowledge, environmental concern as well as demographics and contextual factors.

Attitude emerges as the single most studied variable, being investigated in thirty-two papers. There is broad consensus on the direct and significant impact of consumers' attitudes on their sustainable intentions and behaviors: indeed, twenty-eight papers find a significant and positive impact. In line with Joshi and Rahman (2015), some scholars claim that there are other factors that affect and moderate the strength of the attitude–behavior relationship, either positively like in the case of green advertising (Attia 2014) or negatively like in the case of green skepticism (Zarei and Maleki 2018).

Eighteen studies examine the influence of subjective/social norms and social influence on sustainable intention and/or behavior. Although in twelve studies social influence and norms are found to have a positive correlation with sustainable consumer decisions, compared to attitudes the results appear to be less straightforward as a significant number of studies find no relevant

correlation with actual behaviors. This is consistent with the claim that subjective norms are the only variable in the TPB which significantly depends on economic development (Liobikienė, Mandravickaitė, and Bernatonienė 2016): Minbashrazgah, Maleki, and Torabi (2017) conclude that in contrast to European countries, in some developing countries subjective norms do not affect significantly green purchase intentions.

PBC/PCE represents the third antecedent of behavioral intentions (and, in turn, of actual behaviors) according to the original TPB framework. Of the twenty studies investigating such predictors, seventeen found a positive correlation with SCB, while in three cases the correlation appears to be not significant. This result underlines the important role of maintaining control over conditional factors that might support or hinder sustainable behaviors. Indeed, it is often difficult for individuals to *walk the talk* with respect to sustainable behaviors, if these are (perceived as) demanding from an economic or contextual standpoint. For instance, it has been found that consumers face the difficulty of finding ecological products on store shelves, in addition to their higher price (Nejati, Salamzadeh, and Salamzadeh 2011). Further, in the food waste context, Aktas et al. (2018) found a negative (positive) relationship between the difficulty to store food and intentions (behavior) to reduce food waste. Or, in the domain of recycling, Babaei et al. (2015) found that not having easy access to the recycling bins, lack of awareness toward recycling programs, lack of proper municipality services and lack of financial incentives (rewards and penalties) represent the main hindering factors preventing individuals to act responsively.

Interestingly, while TPB holds its validity across cultural contexts, the relative salience of its constructs may vary according to the country where investigations are performed. Two main differences emerge.

First, there is a difference between developed and developing countries as far as PBC is concerned. Indeed, PBC is a key-predictor of SCB especially in MENA countries and other developing economies (Chan and Lau 2002), while in western countries (although still a relevant predictor) the role played is not as crucial. This is likely due to the lack of both resources and opportunities characterizing developing countries, where the availability of sustainable options might be limited making difficult even for responsible consumers to act according to their sustainability-oriented beliefs. This is not only the case of MENA countries as showed by our review. De Freitas, van Eeden, and Christie (2020) performed an investigation on SCB in South Africa adopting (an extended version of) the TPB framework, finding that PBC showed the strongest impact on behavioral intentions. Similarly, Yang, Li, and Zhang (2018) found that PBC was the stronger predictor of sustainable consumption intention on a sample of Chinese consumers, in the domain of online shopping.

Second, there are culture-specific differences that even differentiate MENA from other developing countries, like in the case of subjective norms. While their role in MENA countries appears to be secondary, individuals from Confucian cultures in the Far East display a much stronger propensity to comply with the norms of their relevant ones (Chan and Lau 2002), as the image they irradiate within their social circles assumes a paramount importance. Lee (1991) labels this collectivistic feature of Confucian societies "group conformity". Although particularly evident in Confucian societies, there is also evidence in literature from other developing countries that, compared to the MENA region, subjective norms and social screening seemingly play a more prominent role: it is the case for instance of South Africa (Strydom 2018) or Brazil (Echegaray and Hansstein 2017).

Altruistic and environmental variables

Environmental (or, more broadly, altruistic) values also emerge as a key driver of SCB in the MENA region. Interestingly, while environmental concern and knowledge/awareness have been investigated by a large number of studies (which indicate, especially in the case of concern, high correlations with SCB), constructs referring to structured normative models such as NAM or VBN (e.g., personal norms, awareness of consequences and responsibility) are considered less frequently.

Environmental concern ranks among the most studied variables, with sixteen out of seventeen studies reporting a significant positive and direct impact of environmental concern on sustainable intentions and/or behaviors. Other studies focus on an indirect relationship between environmental concern and sustainable behaviors. For instance, Vazifehdoust et al. (2013) tested a more complex (indirect) relationship between the two constructs, where environmental concern has a positive effect on consumer's attitudes toward green products, which in turn have an influence on intentions and then behavior. Conversely, Esmaeilpour and Bahmiary (2017) report that environmental attitude of consumers has a significant positive impact on their environmental concerns, which in turn have a positive influence on the decision to purchase a green product. Regardless of the direct/indirect nature of the relationship, the relevance of environmental concern in shaping SCB is also confirmed by non-MENA literature, and supported by a wide range of studies in both developed and developing countries (Prakash and Pathak 2017; Tripathi and Singh 2016; Yadav and Pathak 2016). However, the conclusion of Franzen and Vogl (2013, p. 1006) that, "[…] more wealthy nations tend to have higher environmental concern" can neither be proved nor disproved given the available results in the MENA region. It could be speculated that constructs such as PBC can mediate the effect of environmental concern on actual behaviors, especially in case of SCBs that are difficult to implement either for the lack of alternatives or for the costs they entail. This is seemingly a situation affecting most developing countries: for instance, Lanzini, Pinheiro, and Jara (2018) found that environmental variables are a crucial predictor of the intention to adopt sustainable mobility behaviors in Brazil, but much less so with reference to actual behaviors.

Environmental knowledge (and the closely related concept of awareness) represent the constructs that, besides environmental concern, received most attention in the MENA sample, as they have been investigated by a relevant number of studies, with most articles (seventeen out of twenty-three) suggesting a positive influence on SCBs. Some studies suggest a more complex relationship between environmental knowledge and behavior, with the former having both a direct and an indirect impact on the latter, through attitude (Saleki, Seyedeh, and Rahimi 2012). Further, Abdelradi (2018) finds that, among other factors, environmental awareness is increased by having more knowledge about the food waste problem. Other studies, however, find a non-significant association between environmental knowledge and attitudes toward green purchase (Vazifehdoust et al. 2013). A possible explanation could be the shift from a specific context (e.g., buying organic food) to a generic one (e.g., green purchase), which is consistent with Morren and Grinstein's claim that differences across countries can also be attributable to some methodological aspects where "studies with a general topic have higher effect sizes that those studies who focus on specific behaviors" (Morren and Grinstein 2016, p.102). Overall, the above findings suggest that environmental knowledge and awareness have positive and significant influence on consumer sustainable intention and behavior in the MENA region. Yet, it is still not clear if the distinction between abstract knowledge (awareness of environmental problems, causes, solutions, and so on) and concrete knowledge (awareness of behavioral and practical guidelines) (Schahn and Holzer 1990) could influence SCBs differently.

As previously stated, constructs referring to structured normative models such as NAM or VBN are considered less frequently by studies in the dataset yet display a clearly positive correlation with sustainable behaviors. Interestingly, the normative models that have originally been developed for pro-social and pro-environmental behaviors seem to be far less applied compared to the TPB in general. Steg and Vlek (2009) argue that normative models might be more efficient with low cost behaviors, while TPB works better with high cost behaviors. This conclusion is also evident in Sarkis's study (2017): while VBN is preferred for voluntary green power behaviors related to the public good, TPB is much more suitable for energy efficiency behaviors related to the self. This supports the growing inclination of scholars toward the integration of different models (e.g., Choi, Jang, and Kandampully 2015; Elhoushy 2020; Han 2014;

Kiatkawsin and Han 2017; Yadav and Pathak 2017); however, further comparisons are needed to reveal which theoretical frameworks are most effective across behaviors.

If we focus on NAM constructs, personal norms are found to have a positive relationship with SCB in five of the six analyzed papers. For instance, they show a considerable significant impact on householders' intention to use renewable energy sources (Rezaei and Ghofranfarid 2018); similarly, adding moral norms to the TPB model significantly contributes to the explanation of organic food purchase intentions (Yazdanpanah and Forouzani 2015), consistently with a growing strand of studies across countries (e.g., de Freitas et al., 2020; Graham-Rowe, Jessop, and Sparks 2015; Han and Hansen 2012). Indeed, personal norms do not influence behavior directly, as they are instead correlated to intentions (Klöckner 2013; Rivis, Sheeran, and Armitage 2009). Further, based on the deontic justice theory, Ibrahim and Al-Ajlouni (2018) support the significant positive impact of moral obligation, moral accountability and moral outrage on green purchase intention, which positions green consumption as a moral issue. Notably, norms do not emerge as significant predictors of adopting solar water heaters in the household in the study of Elmustapha, Hoppe, and Bressers (2018): this indicates that consumer decisions (not) to adopt sustainable technologies rely mainly on technology-related attributes rather than on social and moral norms.

As regards the role of awareness of consequences on SCB, it is worth stressing how these can be both immediate and future (or, in other words, awareness can pertain to both short-term and long-term consequences of a given activity). Rice (2006) found a significant impact of anticipated negative consequences (i.e., polluting the environment, causing diseases for children, noise) on pro-environmental behaviors in Egypt, while Dezdar (2017) claims that the consideration of future consequences is positively associated with the intention to use green IT among Iranian students. Evidence from other developing countries such as South Africa (Taljaard, Sonnenberg, and Jacobs 2018) also supports the positive link between awareness of environmental problems

and green intentions. Furthermore, the seriousness of consequences in the eyes of individuals emerges as a relevant issue, capable of affecting behavioral patterns. For instance, Dagher and Itani (2014) found a positive relationship between the perceived seriousness of environmental problems and green purchasing behaviors of Lebanese consumers, with Moon, Mohel, and Farooq (2020) reaching consistent results in Pakistan, where perceived seriousness of environmental problems had significant positive influence on green attitude. Further, Abdul-Muhmin (2007) elaborates on the distinction between local and global environment, in the sense that perceived seriousness of environmental problems in the local environment is more tangible and based on direct personal experience. As a consequence, perceived threats to the local environment will have a relatively larger effect on environmental concern (thus, on behaviors) than perceived threat to the global environment: this makes locally framed messages as potentially more effective in these societies.

The third NAM construct, ascription of responsibility, is also confirmed to exert a positive influence on SCB. For instance, Dagher and Itani (2014) found a positive relationship between Lebanese consumers' perception of environmental responsibility and their green purchasing behaviors, while Minbashrazgah, Maleki, and Torabi (2017) found that perceived environmental responsibility exerts a positive impact on green chicken purchase intention among Iranian consumers. However, evidence also suggests that in many occasions individuals believe that environmental preservation is (mainly) responsibility of *others*, a broad category including not only other citizens, but also (and primarily) actors such as companies or public authorities (Kalantari and Asadi 2010; Yaghi and Alibeli 2017). This is comparable with results from Pakistan (Moon, Mohel, and Farooq 2020), where perceived environmental responsibility had a non-significant influence on green attitude: if this is the case, individuals might be unwilling to pay a premium or to make a contribution knowing that someone else will do it. In a similar vein, Rice (2006, p. 376) concludes that "if individuals are environmentally concerned but are convinced that only

business or the government can provide effective solutions, they might not engage in much pro-environmental behavior". This finding corresponds with the claim that individuals perceive large-scale problems such as climate change and environmental degradation as global issues that require governmental, rather than individual, solutions (Grinstein and Riefler 2015).

In conclusion, the review of literature in MENA countries confirms the importance of altruistic and environmental variables. Yet, from a cultural lens, current evidence suggests that differences can exist between (and within) countries regarding altruistic and moral obligations, even in areas sharing similar cultural backgrounds. This is the case for both developing and developed countries: Arvola et al. (2008), for instance, found that the relative importance of norms with reference to organic food purchase intentions varied between three western countries such as Finland, the UK and Italy. These differences can be attributable to some cultural dimensions, such as the so-called power distance characterizing different countries: most of the MENA countries score high on such element[4], which could explain the observed tendency to ascribe responsibility of global problems to governments.

Conclusions and future steps

Countries in the MENA region are expected to experience an economic growth over the next years and decades which is likely to increase the footprint of communities living in the area, given more affluent production and consumption patterns. Gaining better understandings on the motives underpinning SCB in the region hence assumes a strategic relevance, as a prerequisite for the effective implementation of environmental policies and institutional actions from local as well as international policymakers. Indeed, while most studies and reviews on the topic are based in western countries, it is plausible to infer that different social, economic, and cultural contexts follow (at least partially) different patterns. The review collects and systematizes existing evidence on the topic: most of MENA-based papers are rooted in traditional frameworks of the rationalistic stream, and show environmental values as a

key driver of sustainable behaviors, while habits and socio-demographics are relegated to an ancillary role. Of particular interest are some aspects emerging as peculiar of the region, such as the role of religiosity and (to a lesser extent) of gender. Moreover, while traditional frameworks are confirmed to be effective tools for the analysis of SCBs, the relative salience of their constructs might be different in MENA countries compared to other developed or even developing countries, such as in the case of subjective norms.

As regards such frameworks, however, it is worth stressing how MENA-based research rarely considers theories in their original, complete formulations (that is, analyzing all the variables of the original model). On the contrary, papers often focus on some of such variables only, either alone or in combination with predictors rooted in different theoretical frameworks. This has both positive and negative consequences. While integrating on the one hand different perspectives, it hinders on the other hand an effective comparison of results across studies: since every single investigation focuses on a different set of SCB predictors, it is difficult to identify a common pattern, capable of making sense of an array of empirical results.

Future research should be fine-tuned from a methodological as well as from a theoretical standpoint, as to provide policy makers and all interested parties with a more reliable overview on the antecedents of SCB in the MENA region. As regards methodological aspects, limitations that should be addressed refer to i) the low reliability of self-reported behaviors, ii) the fact that most studies are based on either convenience samples or on students (which might not be highly representative of the overall population), and iii) the fact that most of the studies focus on a limited subset of SCBs, and consider mostly the environmental side while overlooking the social dimension. Future research should hence broaden the scope to behavioral domains that are bound to increase in relevance in years to come (such as private urban mobility) or that are of particular interest given the specificities of the MENA region (such as water saving activities). Further, it would be important to give equal dignity to all

different perspectives representing the pillars of sustainability.

As regards the theoretical perspective, while most investigations adopt a static approach focusing on responsible behaviors in a specific moment in time (that is, stemming from a static decision rather than as a dynamic, unfolding process that evolves over time), future research should consider at once the further stages of consumer decision: that is, the outcomes of SCB and continuance over time. Further, the reviewed literature revealed that scholars delve basically on the rational/cognitive family of theories, while a peculiar aspect emerging from the review reflects the absence of habits as a relevant behavioral predictor; future studies should integrate existing

evidence with analyses that consider both rational/aware behavioral antecedents, and automaticity-related ones. Most importantly, research should avoid the fragmentation that affects most of current investigations, with the adoption of a plethora of heterogeneous variables often lacking an overarching and structured model linking them together in a coherent theory.

Building on the review performed on the determinants of SCB in the MENA region, we wish to conclude our work proposing an interpretive framework, whose empirical testing we leave to future studies (Figure 1). The framework, which is generalizable and testable across a wide range of SCBs, integrates predictors from
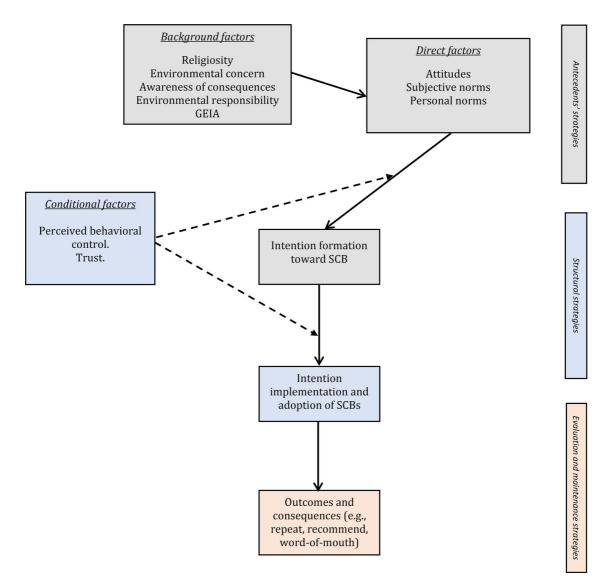

Figure 1. MENA-based conceptual framework for the key determinants of sustainable consumer behaviors.
Note: Dotted arrows represent potential moderating effects.

different mainstream models, considering at once MENA specificities and cultural factors.

The proposed framework suggests three overlapping strategies for communicating SCB to consumers: antecedents' strategies, structural strategies, and evaluation/maintenance strategies. The first focuses on motivational, informational, and educational efforts to activate the key direct and indirect predictors of individuals' intentions toward SCB. Based on the obtained results, it is argued that attitudes, subjective norms, and personal norms play an important role in forming behavioral intentions, which, in turn, lead to the adoption of SCB. Further, another set of factors emerges as relevant to behavioral intention: specific socio-demographic variables (e.g., religiosity), environmental knowledge, awareness of consequences and ascription of responsibility. It has been argued that these variables play an indirect role in shaping intentions and behaviors (Ajzen 1991; Schwartz and Howard 1981; Stern et al. 1999).

Further, MENA-based results highlighted several barriers, such as availability, premium prices and lack of trust. The second strategy focuses on structural aspects, aiming at the removal of barriers and at facilitating SCB. Thereby, both PBC and trust are introduced as conditional variables: that is, attitudes, subjective norms and personal norms are expected to lead to intentions to the extent that individuals hold high PBC and trust the targeted SCB. In addition, trust and PBC also moderate the link between intention and adoption of SCB.

Lastly, the evaluation and maintenance strategy take the conversation forward by focusing on the outcomes and consequences of adopting SCB. Mainstream studies often focus on the antecedents of intentions while sometimes marginalizing behavioral outcomes and, especially, subsequent actions. It is argued that after adopting SCB, individuals will evaluate their perceived performance, which in turn may lead to satisfaction or dissatisfaction, and confirmation or disconfirmation of their beliefs: in this context, perceived performance, confirmation, and satisfaction are key determinants for future behaviors (Oliver 1980). Thus, policy makers, marketers, and researchers need to focus on the post-adoption outcomes to better understand subsequent behavioral patterns (i.e., repeat, recommend, and word-of-mouth).

Notes

1. The interchangeable use of PBC, Perceived Consumer Effectiveness (PCE) and self-efficacy is frequent in the current literature.
2. The complete string can be retrieved from authors.
3. Algeria, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.
4. Official Website of Hofstede's cultural dimensions across countries: Accessed 25th May 2020: https://www.hofstede-insights.com/product/compare-countries/
5. Outcome variable is in *italics* if it is about intentions rather than behaviors, and **bold** if it is about both intention and behavior.
6. Predictors are in in *italics* if they predict intentions rather than behavior, and **bold** if they predict both intention and behavior.

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