




A cross-cultural perspective on facilitators of recycling

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Abstract

This study investigates the overall effect of individual-level variables on predicting recycling in a cross-cultural context. The objective of the study was to investigate the role of social norms and perceived behavioral control as moderators and/or mediators of the relations between culture and reported recycling behavior. A survey was conducted among 172 Jewish and Muslim-Bedouin residents of a rural regional council in Israel. The survey included scales measuring social norms, perceived behavioral control, and reported recycling. Results revealed strong cross-cultural differences in reported recycling behaviors, with higher reported recycling among Jewish than among Muslim-Bedouin residents. Perceived behavioral control made an almost identical contribution to the explained variability of recycling among both Jewish and Muslim-Bedouin residents. Social norms were a significantly stronger predictor in explaining recycling among Muslim-Bedouin than among Jewish residents, yet, no significant interaction effect was found between culture and social norms in explaining recycling. Both social norms and perceived behavioral control mediated the relations between culture and recycling.

Keywords Culture · Recycling · Social norms · Perceived behavioral control · Pro-environmental behavior

1 Introduction

Integrating cross-cultural psychology insights into the study of environmental psychology may provide an important contribution to the study of pro-environmental behavior, yet only few studies have compared societies in terms of environmental variables thus far (Tam and Chan 2017). Of the many studies aimed at identifying the predictors of pro-environmental behavior, only few have considered how culture interacts with these predictors (Morren and Grinstein 2016; Tam and Chan 2017). In the present study, we aim to address this gap by studying the predictors of recycling in the cultural context of Jewish and Muslim-Bedouin residents of Israel.

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Waste generation is one of the world's greatest environmental challenges. Changes in lifestyle, the increase in disposable materials and excessive packaging all contribute to the amount of waste generated. More than four billion tons of solid waste is generated every year; almost half of it is municipal solid waste (Gutberlet 2015), which includes waste generated at households, offices, and retail (Ayalon et al. 2013). In Israel, approximately 80% of household waste is still disposed in landfills (Lavee and Nardiya 2013). Waste disposed in landfills pollutes the air, the land, and the groundwater and is responsible for around 3% of global greenhouse gas emissions (UNEP 2015). It was estimated that an effective waste management could lead to a 10 to 20% reduction in global greenhouse gas emissions (UNEP 2015). Finding ways to reduce the amount of generated waste is thus important for present and future generations (Barr 2007; Ebreo and Vining 2001; Mintz et al. 2019). From an economic perspective, transformation of household waste to landfills has several costs, environmental costs, such as air pollution and underground water pollution, and financial costs, such as transition. In addition, the external marginal cost attributable to greenhouse emissions is between \$3.27 and \$2.22 per compacted ton of garbage disposed for landfills; additional recycling may reduce these costs (Kinnaman 2006).

Recycling refers to the conversion of household waste into resources that have economic value through a process involving collection, processing, and remanufacturing (Varotto and Spagnolli 2017). The first step in this chain is separation at source: the process of separating waste into several categories according to their different characteristics by the household, prior to further treatment. In the past three decades, governments worldwide have developed strategic plans to promote waste recycling (Varotto and Spagnolli 2017; Wan et al. 2017). However, the entire recycling process cannot take place without the cooperation of citizens through primary separation of waste at home (Dupré and Meineri 2016; Varotto and Spagnolli 2017).

Because of the global nature of environmental problems, global-scale solutions are needed and a cross-cultural perspective on pro-environmental behavior is required (Morren and Grinstein 2016). Furthermore, the multicultural nature of societies around the world today has produced diverse norms, traditions, and behaviors that necessitate cultural considerations when developing environmental interventions (Alkaher and Tal 2016). From a theoretical perspective, Oreg and Katz-Gerro (2006) argued that a complete model of pro-environmental behavior should include both individual and social-context variables. Similarly, Fritsche et al. (2018) suggested that since large-scale environmental crises are collective phenomena, resulting from collective, rather than personal behavior, the way they are cognitively represented and appraised is determined by collectively shared interpretations and is differing across social groups (Fritsche et al. 2018).

The predictors of recycling have been investigated in various cultures worldwide, both in Western-individualistic cultures such as the USA (Schultz 1999; Seacat and Boileau 2018), Italy (Gilli et al. 2018) or UK (Barr 2007; Tonglet et al. 2004) and in Asian cultures such as Hong Kong (Cheung et al. 1999; Wan et al. 2017), Taiwan (Chu and Chiu 2003), China (Wang et al. 2019) and India (Halder and Singh 2018). A recent meta-analysis of factors related to recycling has pointed on various individual and contextual factors related to recycling (Geiger et al. 2019); nevertheless, little is known about cross-cultural differences in predictors of recycling. The fact that local recycling facilities may serve either as facilitators or as barriers for recycling (Kaiser and Wilson 2000) makes the investigation of recycling in a cross-cultural context a difficult challenge. In the present study, we overcome this challenge by studying the predictors of recycling among two cultures that live in the same regional council and have similar recycling facilities. The study focuses on Jewish and Bedouin residents of the Misgav Regional Council, a rural council located in the

Galilee in the northern part of Israel that comprises 29 Jewish localities and six Bedouin villages.

The Bedouin are a Muslim subgroup within the Arab minority in Israel that is culturally, historically, socially and politically unique. The Arab population in Israel is considered to be a traditional and collectivistic society that adheres to social roles and authoritarian hierarchy based on gender and age (Haj-Yahia 2000; Cohen 2006). The Bedouin are considered a traditional group within the Arabs in Israel, in which the tribe and the family are of the highest importance (Zevulun 2008). About 30% of the Israeli Bedouin (about 50,000 people) live in northern Israel (The Education.gov 2019), having immigrated to the area from Syria (Ben-David 1999). In recent decades, Bedouin society has been undergoing a modernization process that includes a change in lifestyle and the replacement of traditional forms of employment, and most of the Galilee Bedouin have almost completely abandoned the traditional nomadic lifestyle. Despite this trend, they are still very traditional compared to other Israeli groups (Zevulun 2008), especially the majority group of the Jewish Israeli population. The Jewish Israeli culture is generally an individualistic culture, and most Jewish Israelis live a modern Western style of life (Hofstede and Hofstede 2005; Kurman 2003).

During the last 4 years, the Misgav Regional Council has extensively promoted recycling by establishing a recycling zone in each locality and initiating educational activities among citizens. The combination of a multicultural environment together with extensive facilities for recycling, available to all residences makes Misgav an ideal context for studying the determinants of recycling from a cross-cultural perspective.

Based on relevant cultural knowledge and previous findings, the current study focuses on two groups of recycling predictors: social norms and sense of empowerment.

1.1 Social norms and recycling in a cross-cultural context

Social norms refer to an individual's beliefs about the common or accepted behaviors within a group (Cialdini and Trost 1998). A large body of research has demonstrated the role of social norms in explaining various social behaviors in general (Cialdini et al. 1991; Shteynberg et al. 2009) and pro-environmental behaviors in particular (Schultz and Kaiser 2012). Many studies have investigated the role of social norms in explaining various pro-environmental behaviors, such as electricity saving, transportation, recycling, and reduction in the use of plastic bags (e.g., Schultz 1999; Schultz and Kaiser 2012; Wan et al. 2017; Wang et al. 2019). Two theoretical models are relevant to role of social norms in explaining pro-environmental behavior: the theory of planned behavior (TPB) (Ajzen 1991) and the focus theory of normative conduct (Cialdini et al. 1991). The TPB model (Ajzen 1991) emphasizes behavioral intentions as the most proximal predictor of behavior, affected by social norms, attitudes, and perceived behavioral control. According to the TPB framework, social norms exert social pressure, whereas the main motive for behaving according to these norms is fear of social exclusion (Bamberg and Möser 2007). The focus theory of normative conduct distinguishes between descriptive norms, which refer to perceptions of what is commonly done by other people in a given situation, and injunctive norms, which refer to perceptions of what is commonly approved or disapproved within the culture (Cialdini et al. 1991). According to Cialdini et al. (1991), descriptive norms motivate behavior by pointing out what is effective and adaptive action, whereas injunctive

norms are perceived as the moral rules of the group, with social rewards and punishments attached to compliance to them.

In addition to their role in explaining behavior at the individual level, social norms constitute a key cultural component in explaining behavior at the social and cultural level (Eom and Kim 2015). Zou et al. (2009) suggest that common cultural knowledge and practice are shared between the members of a particular culture and that each individual in the culture understand the world through this shared knowledge and learns to behave accordingly (Zou et al. 2009). Furthermore, Shteynberg, Gelfand and Kim (2009) suggest that cognitions about typical beliefs, values, and behaviors of one's group may serve as important factors in explaining cross-cultural differences in behavior. Indeed, several cross-cultural studies have demonstrated the power of social norms as an individual-level variable that mediates the effect of culture on behavior (e.g., Shteynberg et al. 2009; Zou et al. 2009).

On the other hand, culture may serve as a moderator of the relations between social norms and recycling. Cultural variation in the strength of normative influence has been an important subject of research in cross-cultural and cultural psychology (Eom and Kim 2015). One of the basic distinctions between cultures refers to the importance of the ingroup. The ingroup is much more important in collectivist cultures than in individualist cultures (e.g., Kagitcibasi 2005; Markus and Kitayama 1991). In collectivist cultures, social norms may influence individual actions more than in individualist cultures (Kim and Markus 1999; Zou et al. 2009). Networks that exhibit greater interdependence between members may cultivate a higher degree of social monitoring and therefore lead to more alignment between personal behavior and norms (Gelfand and Harrington 2015). Therefore, it is reasonable to assume that culture will serve as a moderator of the relations between social norms and recycling: Social norms regarding recycling will be a stronger predictor of recycling in a collectivist than in an individualistic culture. Indeed, previous studies found that social norms do exert stronger influences on participants from collectivist cultures (e.g., East Asia) than on participants from individualistic (Western) cultures (Ando et al. 2007; Chan and Lau 2002).

1.2 Effectance motivation and recycling in a cross-cultural context

Effectance motivation—the basic motivation to be an effective and competent social agent (White 1959)—may also serve as an important predictor of recycling. Effectance motivation entails a desire for understanding, predictability, and control over one's environment (Waytz et al. 2010). One of the important basic conditions for any pro-environmental behavior is the feeling that this behavior can bring about changes and help resolve important environmental issues (Hungerford and Volk 1990). Effectance motivation may therefore be an important determinant of any pro-environmental behavior. An effectance variable that was extensively studied in relation to pro-environmental behavior is perceived behavioral control (PBC) (Ajzen 1991).

PBC reflects beliefs regarding the ease or difficulty of performing a particular behavior and the confidence in one's personal ability to perform it (Ajzen 2002). When people believe they lack the requisite resources or are likely to encounter serious obstacles, they usually assess performance of a particular behavior as relatively difficult and maintain a low level of perceived behavioral control (Ajzen 2002). Many behaviors pose execution difficulties that may limit volitional control. Ajzen (1991) argues that the impact of subjective evaluation of behavioral control on action is of greater psychological interest than actual control. In the case of recycling, the perceptions related to the ease and comfort of

sorting household waste and bringing it to the local recycle bins may vary between people, even when the actual distance from their homes to the recycle bins is identical. Findings of previous studies investigating the determinants of recycling confirm that PBC is a significant predictor of recycling intentions and actual recycling (e.g., Barr 2007; Chan and Bishop 2013; Cheung et al. 1999; Wan et al. 2017).

In the present study, we use PBC to measure effectance motivation related to recycling. PBC refers to the belief that an individual has the resources required for recycling. From a cross-cultural perspective, effectance motivation may mediate the relations between culture and behavior: Members of individualist cultures have a higher perception of control over their behavior compared to members of collective cultures, who are more inclined to attribute their performance to external factors such as luck rather than to their own control (Chan and Lau 2002). It can therefore be assumed that PBC will mediate the relations between culture and pro-environmental behavior. Furthermore, PBC may also have a differential effect on behavior in different cultures. According to Markus and Kitayama (1991), while interdependent self-construal is tied to group actions and outcomes, independent self-esteem is informed by individual-based evaluations. Similarly, Ando et al. (2010) and Morren and Grinstein (2016) argued that while in individualistic cultures individuals are held responsible for their own destiny and achievements and rely on themselves, collectivistic cultures are likely to create the belief that group conformity and reliance on others is valuable for the success of the individual and the group. Therefore, PBC may be a stronger predictor of behavior among members of individualist cultures than among members of collectivist cultures. As far as we know, only few studies have investigated the role of culture in the relations between PBC and pro-environmental behavior. Ando et al. (2010) found that the effects of PBC on pro-environmental behavior were stronger in Germany—an individualist culture—than in Japan—a collectivist culture. A meta-analysis of the determinants of pro-environmental behavior (Morren and Grinstein 2016) found that PBC has a more positive impact on intention to behave pro-environmentally in countries that are more developed and mostly individualist than in countries that are less developed and mostly collectivist.

1.3 The present study

The present study aims to examine the overall effect of individual-level variables on predicting recycling in a cross-cultural context. The objective of the study was to investigate the moderating role of culture in the relations between social norms and perceived behavioral control, on the one hand, and recycling, on the other hand. In line with the theoretical background described above, we propose the following:

H1 Social norms regarding recycling will mediate the relation between culture and recycling.

H2 PBC will mediate the relation between culture and recycling.

H3 Social norms regarding recycling will be related to recycling in both cultural groups. However, these relations will be stronger among Bedouin than among Jews.

H4 PBC will be related to reported recycling in both cultural groups. However, these relations will be stronger among Jews than among Bedouin.

Figure 1 summarizes research hypotheses 1–4.

The way in which pro-environmental behaviors should be measured has been the subject of a long-lasting debate in the environmental psychology literature, which has discussed the pros and cons of direct measurement versus self-reports (for a review, see Kormos and Gifford 2014). Self-reports are often thought not to be sufficiently rigorous to investigate pro-environmental behavior due to social desirability and inaccurate self-reports. Yet the alternative, which involves direct observation of recycling bins, has a major disadvantage: The amount of waste in the recycle bins does not provide information on how much recyclable waste was placed in the regular mixed waste bin or on personal percentages of recycling. For example, let us presume that someone places only one plastic bottle in the recycle bins in a week. If this is the only bottle this individual consumed during this week, the implications are different than if it was one of 20 (in that case the other 19 were thrown into the mixed waste bin). In line with this rationale, in this study we used a self-report measure of recycling percentages to assess recycling behavior.

2 Methods

2.1 Participants and procedure

Participants comprised 172 residents of Misgav Regional Council, 92 Jewish (61% women) and 80 Bedouin (50% women). Educational level differed between groups: Of the Jewish participants, 87% had an academic degree, while among the Bedouin participants most (59%) had less than 12 years of studies and only 15% had an academic degree. Gender and academic degree were controlled for in the main statistical analyses. Each cultural group answered a questionnaire in their own mother tongue. An online survey was created in Hebrew and in Arabic and administrated through Google docs. Scales with no Hebrew or Arabic versions were translated and back-translated by two independent translators for each language, who had high proficiency in the languages involved.

In the Jewish localities, invitations to participate in the study were distributed to the residents via local mailing lists. In the Bedouin villages, where there were no local mailing lists, we used social networks to reach participants, and employed an Israeli-Arab student

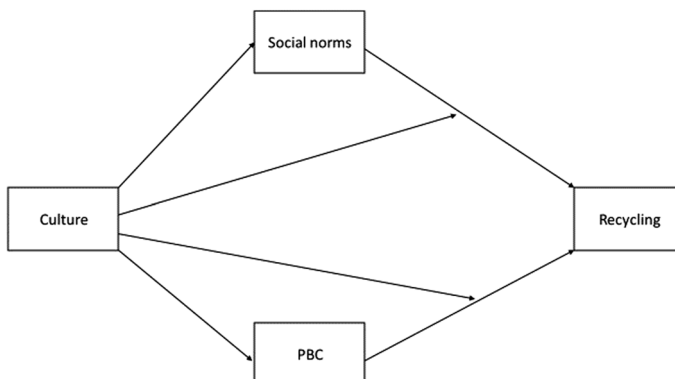


Fig. 1 The theoretical model

who reached out participants in the Bedouin villages, and asked them to fill in the online questionnaire. Two monetary prizes of five hundred Israeli New Shekels were offered by lottery to encourage participation.

2.2 Measures

The first part of the survey comprised items measuring PBC and social norms. The second part consisted of two measures of self-reported recycling, and the third part focused on demographics.

2.2.1 Social norms

Items for social norms were designed based upon previous studies that focused on determinants of waste management behaviors (Bortoleto et al. 2012; Tonglet et al. 2004). Four items measured social norms ($\alpha = .88$ and $.66$ for Jews and Bedouin, respectively).

2.2.2 PBC

Items for PBC scales were also designed based upon previous studies that focused on determinants of waste management behaviors (Bortoleto et al. 2012; Tonglet et al. 2004). Three items measured PBC ($\alpha = .71$ for both samples).

All items are given in Table 1. Respondents rated the extent to which they agreed with statements on a 6-point Likert-type scale ranging from 1 (do not agree at all) to 6 (fully agree).

2.2.3 Reported recycling behavior

Participants were asked to indicate what percentage of all the products they use they recycle, with specific reference to seven categories of products for which recycle bins are available in Misgav (glass, plastic bottles, paper, clothing, containers of various kinds, aluminum cans and cardboard), on a 6-point Likert-type scale ranging from 1 (0–10%) to 6 (91–100%). Hereafter, the term “recycling” refers to “reported recycling”.

The measures scores for each of the variables—social norms, PBC, and recycling—were calculated by the mean of the items that composes each measure.

Table 1 Items measuring PBC and social norms

Measure	Items
Perceived behavioral control	Recycling is easy
	I know where to take my household waste for recycling
	I know what items can be recycled
Social norms	Most people who are important to me think that it is important to recycle their waste
	Most people who are important to me make an effort to recycle their waste
	Most people I know recycle their waste on a regular basis
	Most people I know think that it is important to recycle their waste

Table 2 Means and standard deviations (in brackets) of the study variables by culture

n	Bedouin sample ($N=80$)	Jewish sample ($N=92$)	$F_{(1, 169)}$	η_p^2
Perceived behavioral control	3.40 (1.22)	5.08 (.97)	27.66**	.14
Social norms for recycling	3.12 (1.07)	4.44 (.98)	25.78**	.13
Recycling	2.2 (.88)	5.28 (1.1)	169.43**	.50

Table 3 Correlations among the research variables for each cultural group

	1	2	3
1. Perceived behavioral control	1	.24*	.36**
2. Social norms	.78**	1	.26*
3. Recycling	.50**	.57**	1

Jewish sample above the diagonal, Bedouin sample below the diagonal

* $p < .05$; ** $p < .01$

2.2.4 Demographic information

Participants reported their age, gender, education (four levels—less than 12 years/12 years/bachelor's degree/master's degree or doctorate), and place of residence.

3 Results

Before testing the research hypothesis, we conducted a multivariate analysis of variance (MANOVA) to examine cultural differences in the research variables. Education and gender were covariates. The multivariate culture effect was significant (*Hotelling's T* = 1.0, $F_{(3, 167)} = 55.81$, $p = .00$, $\eta_p^2 = .50$). Table 2 shows the results of the univariate tests. Jews scored significantly higher than Bedouin on all three variables. Jewish (J) were significantly higher than Bedouins (B) in PBC (J: $M = 5.08$, $SD = .97$, B: $M = 3.40$, $SD = 1.22$), social norms for recycling (J: $M = 4.44$, $SD = .98$, B: $M = 3.12$, $SD = 1.07$) and recycling (J: $M = 5.28$, $SD = 1.1$, B: $M = 2.2$, $SD = .99$). It is important to note that the cultural difference in reported recycling is higher than the differences in the other variables, as indicated by the level of F and η_p^2 values. For PBC, $F_{(1, 169)} = 27.66$, $\eta_p^2 = .14$; for social norms: $F_{(1, 169)} = 25.78$, $\eta_p^2 = .13$; and for recycling, $F_{(1, 169)} = 169.43$, $\eta_p^2 = .50$.

The mediation effects of both norms and PBC as mediators of the relations between culture and recycling, controlled for gender, age and education level, were analyzed using the INDIRECT macro for SPSS (v. 2.03). This application allows the testing of multiple paths while employing a bootstrapping procedure with 1000 resamples (Preacher and Hayes 2008). The indirect paths, through social norms and PBC, were both significant: culture–norms–recycling: $b = -.24$, $SE = .14$, CI bootstrap = $[-.50, -.09]$; and culture–PBC–recycling: $b = -.36$, $SE = .11$, CI bootstrap = $[-.63, -.17]$. These findings support the first and second research hypotheses.

Table 4 Prediction of recycling by the study's variables for each of the two samples

	Jewish adj. $R^2 = .20^{**}$	Bedouin adj. $R^2 = .37^{**}$
	β	β
Age	.23*	.07
Education	.17	-.27*
Gender ^a	.04	.10
Perceived behavioral control	.32**	.32*
Social norms	.21*	.41**

* $p < .05$; ** $p < .01$ ^aDummy variable. Women = 0, men = 1**Table 5** Standardized regression coefficients predicting recycling by the study's variables across cultures

	Adj. $R^2 = .76^{**}$
	β
Culture ^b	-.60**
Age	.05
Education	.01
Gender ^a	.01
Perceived behavioral control	.27**
Social norms	.14*
Culture \times perceived behavioral control	-.11
Culture \times social norms	.05

^aDummy variable. Women = 0, men = 1^bDummy variable. Jewish = 0 Bedouin = 1* $p < .05$; ** $p < .01$

Next, we tested culture as moderating the relation between social norms and recycling, and the relation between PBC and recycling. First, correlations (Table 3) were calculated among the research variables for the two cultural groups separately. PBC was positively related to social norms in both the Jewish and Bedouin samples. For both Jewish and Bedouin participants, recycling correlated with both PBC and social norms. We compared the strength of the correlations in the two cultural groups (Lenhard and Lenhard 2014). The correlation between social norms and recycling was significantly higher for Bedouin than for Jews ($z = 2.45, p < .01$). The correlations between PBC and recycling did not differ significantly between the two groups ($z = 1.11, p = .13$).

Multiple regressions were calculated for each culture (Table 4) to test whether social norms and PBC remain significant after a control over the demographic variables. Table 4 shows that the research variables together with demographic variables explained 20% of the variance in recycling for the Jewish sample and 37% in the Bedouin sample. Within the Jewish sample, the variables that contributed significantly to the explanation of recycling are age (higher age is related to higher levels of recycling) ($\beta = .23, p < .05$), PBC ($\beta = .32, p < .01$), and social norms ($\beta = .21, p < .05$). Within the Bedouin sample, the variables that contributed significantly to the explanation of recycling are education (lower level of education is related to higher levels of recycling) ($\beta = -.27, p < .05$), PBC ($\beta = .32, p < .05$), and social norms ($\beta = .41, p < .01$).

Multiple regression was performed next (Table 5), for the two samples together, in which we examined whether there were interaction effects of culture \times social norms, and of culture \times PBC. Given that the culture variable is not a continuous variable, we used dummy variables to compare the two groups. (We defined being Jewish as 0 and being Bedouin as 1.)

As given in Table 5, when the two samples were combined, the model explained 76% of the recycling variance, and the variable with the highest contribution to the explained variability was culture ($\beta = -.60, p < .01$). PBC significantly contributed to the explained variability of recycling ($\beta = .27, p < .01$) as well as social norms ($\beta = .14, p < .05$), and the interaction of these variables with culture was not significant.

4 Discussion and conclusion

This study focused on the effects of perceived behavioral control and social norms in explaining recycling in two cultural groups—Jews and Muslim-Bedouins—that live in one regional council. The study tested the hypotheses that cultural context may affect how social norms and perceived behavioral control are related to recycling.

Results indicate that Jewish participants were higher on both social norms and PBC as well as in the reported recycling. In addition, in line with the first and the second research hypotheses, the results indicate that both social norms and PBC mediated the links between culture and recycling. These results are in line with previous studies which indicated that cultural dimensions such as power distance, individualism, and self-construal indirectly influence pro-environmental behavior and behavioral intentions and that both social norms and PBC mediate these relations (Liobikienė et al. 2016; Mancha and Yoder 2015; Oreg and Katz-Gerro 2006).

The third research hypothesis was partly supported. As predicted, the results indicate that social norms for recycling are related to recycling in both cultural groups. These results are in line with previous studies that found that social norms significantly predict recycling in various cultures and countries, in Western as well as Eastern cultures, and in developed as well as developing countries (Wang et al. 2019; Wan et al. 2017). It was also found that these relations are stronger among Bedouin than among Jews. This trend was supported by the difference in the contribution of social norms to the regression models in the two samples. The differences in the correlation sizes supported this trend as well. Nevertheless, the interaction of culture and social norms was not significant, and these findings are different from previous findings on the differential effect of social norms on behavior in different cultures (Shteynberg et al. 2009; Kim and Markus 1999; Zou et al. 2009).

The fourth hypothesis was partly supported. As hypothesized, PBC is related to reported recycling in both cultural groups. These findings are congruence to findings of previous studies which found that PBC is a significant predictor of recycling in various cultures (Chan, and Bishop 2013; Tonglet et al. 2004; Wan et al. 2017). However, PBC was not more central in predicting recycling among Jews than among Bedouins. PBC significantly contributed to the explained variability of recycling in both cultural samples, and the difference between the respective correlation sizes was not significant. These findings are inconsistent with previous studies on the effect of PBC on pro-environmental behavior in cross-cultural context (Ando et al. 2007; Morren and Grinstein 2016). Taken together, these findings point to the possibility that while the Bedouin conform to a collectivist pattern by behaving according to social norms, they may have relatively high effectance motivation

due to their exposure to the Western majority in which they live. Having both high collectivism and high individualism is quite typical of societies in transition (Kagitcibasi 2005; Oyserman 1993).

The differences in the level of both recycling and its two determinants—social norms and PBC—between the two participating groups is interesting because although the policy of the local authority was the same regarding all their residences, the outcomes were definitely different among the two cultural groups. Several reasons may explain this pattern of results. First, from a social point of view, these differences may result from differences between the Bedouin minority and the Jewish majority in willingness to conform to authorities' requests to recycle. Previous studies have already shown that differences may exist between majority and minority groups in certain pro-environmental behaviors (Milfont et al. 2006). In the case of recycling, differences between majority and minority groups may be related to the fact that pro-environmental behavior is promoted by the government and the local authorities. In addition, the fact that social norms regarding recycling are significantly lower among the Bedouin might result from dissemination activities which were mainly promoted by Jewish members of the local authorities, and insufficiently based on collaborators from within the Bedouin communities. According to the model of social influence in groups, when social identity is salient, people construct a context-specific group norm from available social comparative information (Terry and Hogg 1996). From this point of view, a norm has its effect because a specific group is socially relevant. It was also suggested that in many times people calculate collective rather than personal costs and benefits of pro-environmental action and wonder whether they are efficacious as a collective rather than an individual to bring about pro-environmental change. Accordingly, social identities and related processes of ingroup identification, perception of collective efficacy, ingroup norms and goals, as well as group-based emotions and social identity motivations relate to both appraisals of and responses to large-scale environmental crises (Fritsche et al. 2018). The implication of this rationale is that to enhance specific behavior such as recycling in a multicultural society, it is important to involve collaborators from all cultures involved to enable identification of all sub-cultures.

From a cultural point of view, the differences in norms, PBC, and reported recycling may be related to the fact that in their origin the Bedouin are Nordic tribes. There are indications in evolutionary psychology that the nomadic lifestyle of people in prehistoric times actually facilitated our tendency to create trash. If trash accumulated, nomads would just leave the place behind and go to the next place (Griskevicius et al. 2012). Therefore, the historic origin of the Bedouin as Nordic makes the integration of waste management norms into the daily norms a more difficult mission; this again calls for a cooperation of the community leaders and educators.

From a methodological point of view, these differences may be caused by cultural differences in response style: In social sciences, it is well known that self-report questionnaires are vulnerable to social desirability bias due to respondents' tendencies to answer in a more socially acceptable way (Cerri et al. 2019; Fisher 1993). A question may therefore raise if the differences between the Jewish and the Bedouin participants are caused by cultural differences in social desirability bias. While several studies have confirmed that social desirability bias may be related to culture, the direction of difference in previous studies differs from the present: Members of collectivistic cultures were found to be more inclined to social desirability bias compared to individualistic cultures (Kim and Kim 2016). In addition, members of minority groups tend to be more inclined to social desirability bias compared to the majority groups (Johnson and Van de Vijver 2003). In the present study,

the Jewish are the majority social group and more individualistic. We therefore believe that the differences in reported recycling and in social norms and PBC did not result from cultural differences in social desirability bias.

Another interesting result that was found in this study is the negative relation between level of education and recycling among Bedouin. Previous studies mostly indicated that individuals with more education are generally more concerned about the environment (Gifford and Nilsson 2014). In the current study, the transition of Bedouin society from a traditional society of farmers into a modern society of educated professionals may lead the modern educated members of the community to be less concerned about environmental issues than the old-fashioned farmers, who are more connected to the land. Nevertheless, this result may be also a result of a stronger tendency to choose the midpoint among lower educated people (Holbrook et al. 2003).

4.1 Research contribution and implications

Thus far, only very few studies have compared the level of pro-environmental behaviors and their determinants between Arab and Jewish residences in Israel. This study is one of the firsts in this field. More specifically, this study is one of the firsts that study pro-environmental behavior among members of the Bedouin society in Israel. Taken together, the research findings point to the possibility that while the Bedouin conform to a collectivist pattern by behaving according to social norms, they may have relatively high effectance motivation due to living with and being exposed to the Western majority.

The findings of this research contribute to a better understanding on determinants of pro-environmental behavior in multicultural societies and in cross-cultural context. Furthermore, since many societies around the globe today are multicultural societies, the results of this study are relevant to policy makers around the globe. The results of this study have practical implication for policy makers. While developing interventions and campaign for enhancing recycling, it is recommended to provide all relevant audience enough information which helps them feel competent in performing the behavior, including where the recycle bins are situated, which materials fit each recycle bin, and other practical information that can enhance perceived behavioral control. In addition, we suggest that campaigns will convey a normative message to the residents that recycling is considered as the right thing to do, and it is the common behavior. From a cross-cultural point of view, in multicultural areas, it is important to develop campaigns implying that recycling is the normative behavior within their own group.

The variables that were discussed here as possible sources of cross-cultural variation in predicting recycling are social norms and PBC, which are central to the theory of planned behavior (Ajzen 1991). This model has been used extensively to predict and explain various pro-environmental behaviors (e.g., Bamberg and Möser 2007; Kaiser et al. 2005; Morren and Grinstein 2016). While the theory was found as effective in explaining behavior in various cultural settings, most of the research thus far was conducted in Western cultures (Morren and Grinstein 2016). The findings of the present study could contribute to the discussion about how different variables in this model may have differentiated power in explaining pro-environmental behavior in a cross-cultural context.

4.2 Research limitations

Several limitations of our research need to be considered. The number of participants was small for a survey. Demographic differences in education and age were controlled for, but other demographic differences were not (e.g., socioeconomic status). The sampling method for the two groups was not identical. Other cultural differences that may account for differences in recycling between the groups were not measured (e.g., place and civic attachment, see Scannell and Gifford 2010). Another limitation relates to the relatively low alpha in the measure for social norms among the Bedouin. This may be related to possible problems in response style among the Bedouin participants.

Another limitation concerns the variables that were chosen as the predictors. Since the focus of investigation in this research was the role of culture, we measured two independent variables which we assumed to have differentiate effect on recycling among Jewish and Bedouin—social norms and PBC. As aforementioned, in the literature on determinants of behavior these two variables are often viewed as part of the theory of planned behavior (TPB). According to the TPB model, the immediate antecedent of a behavior is behavioral intentions and the three variables—attitudes toward the behavior, social norms, and PBC—determine this behavior indirectly via behavioral intentions. A more comprehensive use of all four possible determinants of behavior, as suggested by the TPB model, including attitudes and behavioral intention is needed, especially because the relation between intentions and behavior is weak because of internal or external barriers such as convenience and motivation (Kollmuss and Agyeman 2002). Future research should test the full TPB model.

Despite these limitations, given the scarcity of studies focusing on pro-environmental behavior in these communities, we believe that this research makes an important contribution to the development of scientific knowledge on pro-environmental behavior and its determinants in multicultural communities.

4.3 Directions for future studies

This study focused on two cultural groups in Israel. We suggest expanding the investigation of the model to additional cultural groups that represent individualistic and collectivistic societies.

In this study, a significant difference was found in the reported level of recycling between the two participating samples. As stated above, differences between minorities and majorities in complying with authorities' requests may lead to differences in pro-environmental behaviors related to authorities' requests, such as recycling. We therefore suggest that in the future, minority and majority compliance to governmental initiatives should be studied using civic identity.

4.4 Conclusions

The results of this research have theoretical significance as well as practical implications. From a theoretical perspective, they highlight the importance of integrating culture and cultural considerations into any theoretical model that aims to explain pro-environmental behavior, and specifically models that focus on social norms, and PBC. From a practical point of view, this study provides directions for developing culturally tailored

messages for campaigns and educational initiatives aimed at promoting pro-environmental behavior in diverse and multicultural communities. In addition, our research results highlight the importance of integrating normative messages as well as information that enhance PBC in recycling initiatives, as a mean to enhance population cooperation. Given the aforementioned environmental and economic advantages of recycling, getting public engagement is essential for promoting any recycling program. Furthermore, the cost of waste separation at source varies between municipalities, affected by their specific characteristics such as city size, population density, distance to disposal sites, and waste characteristics (Broitman et al. 2012). Within municipal boundaries, solid waste source separation requires a complex system including the purchase of additional collection equipment as well as promotional activities for attracting public awareness (Lavee and Nardiya 2013). Hence, finding effective ways for enhancing public awareness and cooperation is important for both environmental and economic reasons.

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