ARCHIVIO ISTITUZIONALE DELLA RICERCA

Alma Mater Studiorum Università di Bologna
Archivio istituzionale della ricerca

Predicting recycling in Southern Italy : An exploratory study

This is the final peer-reviewed author's accepted manuscript (postprint) of the following publication:

Published Version:
Pivetti, M., Melotti, G., Vespa, M., Cappabianca, F., Troilo, F., Placentino, M.P. (2020). Predicting recycling in Southern Italy : An exploratory study. RESOURCES, CONSERVATION AND RECYCLING, 156, 1-13 [10.1016/j.resconrec.2020.104727].

Availability:
This version is available at: https://hdl.handle.net/11585/728892 since: 2024-05-02

Published:

DOI: http://doi.org/10.1016/j.resconrec.2020.104727

Terms of use:

Some rights reserved. The terms and conditions for the reuse of this version of the manuscript are specified in the publishing policy. For all terms of use and more information see the publisher's website.

This item was downloaded from IRIS Università di Bologna (https://cris.unibo.it/).
When citing, please refer to the published version.

(Article begins on next page)

09 November 2026

Predicting recycling in Southern Italy: An exploratory study

Monica Pivetti[a,*], Giannino Melotti[b], Mariangela Vespa[a], Francesca Cappabianca[a], Fabio Troilo[a], Matteo Pio Placentino[a]

[a] Department of Psychological, Health and Territorial Sciences (Di.S.P.U.Ter.), University of Chieti-Pescara, Chieti, Italy
[b] Department of Education Studies «Giovanni Maria Bertin» (E.D.U.), University of Bologna, Italy

* Corresponding author at: Department of Human and Social Sciences, University of Bergamo, Italy.
E-mail address: monica.pivetti@unibg.it (M. Pivetti).

Keywords:
Recycling
Waste separation
Values
Trust
Attitude
Environment

ABSTRACT
The waste disposal crisis in Southern Italy has led to a phenomenon dubbed 'the Land of Fires,' where illegal waste disposal and toxic fires of waste are currently contaminating the land, the ground and surface water, and the air quality. The general aim of this study was to investigate the psychosocial factors involved in the prediction of municipal solid waste separation, in a convenient sample of the inhabitants of three areas of Southern Italy, that is specifically the Land of Fires territory (Campania region), Abruzzo and Puglia. We put forward a model involving both pro-environmental concerns and cognitive evaluations. A written questionnaire was administered to a sample of 313 inhabitants from the three areas. Structural equation modelling was performed on the data. The findings confirmed the hypothesized relationships between study variables. The results showed that internal attribution and social norms were the strongest predictors of attitude, followed by the level of knowledge. Biospheric and altruistic values weakly predicted attitudes. Attitude strongly predicted the behavioural intention, which in turn predicted pro-environmental behaviour (i.e. recycling). Trust in institutions was unrelated to the recycling attitude. Attitudes partially mediated the relationship between internal attribution and behavioural intention, and between social norms and behavioural intention. Based on those results, some suggestions are put forward to improve recycling behaviour in the relevant territories.

1. Introduction

As a consequence of increasing the human population and material consumption, the issues of waste disposal and recycling have become of great importance to governments and municipalities. Municipal solid waste (MSW) is also known as 'trash' or 'garbage.' It includes various kinds of material waste such as durable and nondurable goods, packaging boxes and other garden and food waste. MSW generally refers to household waste, office and retail waste, but excludes construction waste, industrial and hazardous waste.MSW management involves collection, transportation, disposal to the landfills and recycling of MSW generated in a territory (Centre for sustainable systems, 2013; Verma et al., 2020). Waste is classified on the basis of two parameters: the origin and the hazard. Waste generated by households and similar activity are classified as urban waste, the others are classified as special waste (i.e. commercial, industrial). Hazardous waste is the waste thus defined by the legislation or the waste containing dangerous substances in a concentration higher than given thresholds. Urban waste is classified as non-hazardous (Di Maria et al., 2020).

MSW production is becoming both an environmental and economic burden for society. It is, therefore, of great importance that households should engage in recycling and source separation (Swami et al., 2011). To reduce the amount of waste ending up in landfills, local governments have implemented numerous recycling and waste reduction programs, including source separation, source reduction, variable garbage pricing, curbside recycling and drop-off recycling[1] (Sidique et al., 2010).

According to Di Maria et al. (2020), stringent implementation of a political, legal and economic supporting scheme for waste management at Italian level started in 1997 after the adoption of the first EU directives 91/156/CEE on waste, 91/689/CEE on hazardous waste and 94/65/CE on packaging waste. This first directive establishes the role of central and regional government together with the role of municipalities. For MSW, central government is responsible for legislation implementation in waste management, regional authorities are responsible for planning waste management at regional scale and municipalities are responsible for providing waste management.

In Italy, recent statistics have indicated that there is substantial need for improvement in household waste management and source separation behaviour. The amount of MSW pro-capita was 499.7 kg in 2018, while the percentage of separated MSW was 58.1 %. Great differences emerge in the regions of Southern and Northern Italy, with lower separated MSW in the South and higher separated MSW in the North (ranging from just 29.5 % inSicily, to a much as 78.3 % in Veneto region) (Source: Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA, 2019; Agovino et al., 2018).

Source separation and separate collection allows the waste to be sorted upstream, from the total of household waste, with a view to its recovery and recycling. Within source separation, each material is cleaned and sorted prior to collection. Separate waste collection is characterised by numerous advantages. First of all, it allows the volume and quantity of the household waste transported to disposal plants to be reduced, thereby generating direct benefits, i.e. a reduction in transport costs and relevant energy savings. Secondly, it allows quality materials to be recovered for reuse and it reduces the amount of waste to be eliminated, generating other direct benefits, namely a reduction in pollution and in disposal costs (Agovino and Musella, 2020; Sustainable Development Foundation Dossier, 2016). This method also requires the least post-collection sorting and produces the purest recyclates.

Since 1980, waste management in the Campania region has been crisis-stricken, resulting in the widely documented illegal disposal of urban, toxic and industrial waste and in the phenomenon dubbed 'the Land of Fires,' that is a territory situated between Naples and Caserta, where illegal waste disposal and toxic waste fires are endangering citizens' health and increasing diffidence towards institutions. The environmental impact of illegal waste disposal has led to the deterioration of the land, as well as the ground and surface waters, also impacting air quality (Osservatorio Ambiente e Legalità di Legambiente, 2007; Senior and Mazza, 2004).

Recently, other southern regions such as Puglia and Abruzzo have reported episodes similar to those described in the "Land of Fires" issue, with a number of news reports describing criminal responsibility in illegal waste disposal and lighting toxic fires. For instance, in Puglia in 2019, the rangers mapped 56 illegal landfills in the territory of Carbonara, Ceglie and Santa Rita, near Bari (La Repubblica, 11 January 2019; Peluso, 2015). In Abruzzo, the illegal landfill of Mosciano Sant'Angelo (TE), discovered in 2016, has never been reclaimed (ABR24 News, 26 February 2018).

[1] Drop-off recycling is a recycling program where designated sites are established to collect a range of recyclables and usually recyclers themselves are required to deposit the sorted recyclables in specially marked containers. Drop-off recycling centres are less costly to operate compared to curbside programs, and they are also faster to implement than take-back and deposit refund programs involving manufacturers. Drop-off centre operators are able to save on labour and transportation costs because these costs are transferred to the recyclers. Drop-off recycling is also considered to be a financially viable recycling option in rural areas with low population density (Sidique et al., 2010)

Whereas the illegal waste disposal and the open burning phenomenon concerns the whole of the Italian peninsula, the Campania case has spawned a variety of studies focusing on distinct aspects of the crisis, namely the relevance of the toxic waste business involving the camorra (the regional mafia equivalent) and corporations across Italy and Europe (e.g. Fontana et al., 2008), legal analyses (e.g. Raimondi, 2007), health risks and epidemiological assessments (e.g. Martuzzi et al., 2008), the impact of landfill sites (e.g. de Medici, 2007), the institutional responsibilities of waste mismanagement (Rabitti, 2008), the absence of MSW treatment facilities in the area (e.g. De Feo and De Gisi, 2010), the emergence of the inter-linkages between society and nature in environmental conflicts (Armiero, 2008), the role of activism (Musella, 2008; Scafuto and La Barbera, 2016), and the political implications of the crisis (Barbieri and Piglionica, 2007). Along these lines, the waste management crisis is more complex than the inability of southern Italians to properly separate HW (D'Alisa et al., 2010).

However, increasing the amount of MSW separated in the houses of Southern Italy could improve the waste crisis situation by reducing the amount of waste to be disposed of in landfills. Along these lines, intervention effectiveness is increased by personalization and audience segmentation (Varotto and Spagnolli, 2017). Indeed, a mass social change in recycling behaviour could lead to a reduction in the household waste to be disposed of, which is first step for a correct waste management process. In the last two decades, there has been a call for psychologists to play a more concerted role in promoting behavioural changes that will accrue benefits for the environment, with a focus of psychological research on household waste management.

As for the psychosocial variables, researchers believe in the importance of studying factors such as values, attitudes and beliefs, capable of predicting (and increasing) recycling rates and the engagement of households in recycling (Swami et al., 2011). A range of theoretical models of health psychology have been put forward to explain and predict pro-environmental and recycling behaviours (e.g. Bamberg and Möser, 2007; Hines et al., 1987; Steg et al., 2014; Steg and Vlek, 2009). Researchers generally endorse one of the two theoretical frameworks available: the value-belief-norm theory (VBN; e.g. Stern, 2000) and the theory of reasoned action (TRA; e.g. Fishbein and Ajzen, 1980). While the former focuses on values and moral norms, the latter is grounded on rational choices.

1.1 The value-belief-norm theory

The VBN theory builds on Schwartz's norm-activation model theory (NAM; 1973) of altruism, according to which altruistic and pro-environmental behaviours occur in response to personal/moral norms (PN) activated in individuals who believe that particular conditions pose threats to others (awareness of adverse consequences, AC) and that the actions they undertake could avert those consequences (ascribing responsibility to oneself, AR) (Stern, 2000). Schwartz (1977) conceived moral norms as feelings of strong moral obligations that people experienced for themselves to engage in pro-social behaviour. The VBN theory links value theory and norm-activation model theory through a causal chain leading to behaviour: new environmental paradigm, AC and AR beliefs, personal norms and pro-environmental action.

Three types of values have been distinguished that proved to be particularly relevant for understanding environmental beliefs and actions. While egoistic values make a person focus on safeguarding or increasing his or her resources, altruistic values reflect a key concern with the welfare of others, and biospheric values reflect a key concern with nature and the environment for its own sake (de Groot and Steg, 2008). Generally, individuals who strongly endorse egoistic values are less likely to have pro-environmental beliefs and norms and to act proenvironmentally, while the opposite is mostly true for those who strongly endorse altruistic or biospheric values (e.g., de Groot and Steg, 2009; Hansla et al., 2008; Steg et al., 2014).

The application of VBN to MSW separation behaviour has provided some support to the theory. In a typical study, the model showed that parents can create norms in young children to recycle and re-use paper (Matthies et al., 2012). In Sweden, Sælen et al. (2012) found that values and environmental attitudes are more strongly correlated with behaviour related to waste disposal and the domain of food, than with behaviour relating to domestic energy and transportation.

1.2 Theory of reasoned action

According to this theory, decision-making is driven by a rational evaluation of the behavioural consequences. According to the Theory of Reasoned Action (TRA; Fishbein and Ajzen, 1980), the most important determinant of behavior is behavioral intention. Direct determinants of individuals' behavioral intention are their attitude toward performing the behavior and their subjective norms associated with the behaviour. On the one hand, the attitude towards behaviours determined by beliefs regarding the possible outcome of certain behaviour and the evaluation of that outcome. On the other, subjective norms are determined by beliefs regarding what relatives, friends and significant others think of the behaviour as well as one's motivation to comply with them. An extension of the model proposed by Ajzen (1985), the theory of planned behaviour (TPB), explicitly incorporates perceived behavioural control as an antecedent to behavioural intentions (Madden et al., 1992). Many studies have fruitfully applied TRA or TPB to the MSW recycling and source separation in Great Britain (Greaves et al., 2013), Scotland (Knussen et al., 2004), Turkey (Oztekin et al., 2017), Italy (Carrus et al., 2008), Germany (Matthies et al., 2012), The Netherlands (Árnadóttir et al., 2019), China (Shen et al., 2019; Wan et al., 2012; Wang et al., 2019), Switzerland (Visschers et al., 2016), Lithuania (Poškus, 2016). Consistently, attitudes, subjective norms, perceived behavioural control and intentions significantly predicted MSW separation behaviours.

1.3 Value-belief-norm and theory of planned behaviour: a possible integration

While VBN theory focuses on the moral norms behind pro-environmental behaviours, the TRA theory points to the role played by intentions to behave in a pro-environmental way. Some attempts were made to reconcile the two theories by integrating their fundamental dimensions in a more comprehensive view. Kaiser (2006) tested the idea that moral norms could predict attitudes towards conservation behaviour. Given the almost perfect correlation between attitude and moral norms, the Author concluded that attitude towards conservation behaviour might represent primarily moral considerations. Bamberg and Möser (2007) conducted a meta-analysis of psycho-social determinants of pro-environmental behaviour, starting from 46 studies published between 1995 and 2006. They used Structural Equation Model (SEM) to test the goodness of an amalgam of TRA and NAM determinants, such as problem awareness, social norms, moral norms, guilt feeling, perceived behavioural control, attitude, behaviour intention. Results confirmed that pro-environmental behavioural intentions mediate the impact of all other psycho-social variables on pro-environmental behaviour. Moreover, besides attitude and behavioural control, personal moral norm is a third predictor of pro-environmental behaviour intention.

As for recycling and source separation behaviour, some studies have focused on the possible integration of the various theories on pro-environmental behaviour, in the search for a model predicting recycling. Oreg and Katz-Gerro (2006) built on (a) Ajzen's TPB, (b) Stern et al.'s VBN theory and (c) Inglehart's postmaterialist and Schwartz's harmony value dimensions, to test a model that predicts recycling behaviour, in a 27-country sample. The results provided a strong, cross-national validation of the TPB model, whereby behavioural intentions mediate the relationship between pro-environmental attitudes and behaviours. Aguilar-Luzón et al. (2012) compared the TPB and the VBN models in predicting glass separation, in a sample of 154 Spanish housewives. The authors performed SEM to test the two models independently. The results showed that only the TPB model was accepted, whereas the VBN model was rejected. The former has a greater degree of fit and a greater capacity to predict recycling behaviour than the VBN model. Chan and Bishop (2013) extended the TPB by including moral norms as a predictor of behavioural intention to recycle, which, in turn, predicted recycling behaviour. SEM showed that the combination of moral norms, subjective norms, and perceived behavioural control was able to explain 39 % of the variance in recycling intention.

Moreover, some studies have suggested that trust in authorities plays a key role in facilitating cooperation and contributing to the public good (De Cremer et al., 2001; Van Lange et al., 2013). Nguyen et al. (2015) found that citizens' trust is the best predictor of the intention to perform MSW separation, followed by personal moral norms. Konisky et al. (2008) found that more trusting individuals are more supportive of government action to

address pollution problems and global issues. Analysing data from the International Social Survey Programme (ISSP) 2010 – Environment III, Harring et al. (2019) supported a positive link between generalized trust, institutional trust, and institutional quality on reported MSW separation. In Southern Italy, De Feo (2014) showed that trust in the local authorities played a pivotal role in the success of a separate collection program.

2. Overview and hypotheses of the study

This exploratory study aims to propose a model predicting pro-environmental behaviour, namely MSW separation in Southern Italy. We aim to test this model in three Italian territories: (1) one notoriously known as 'the Land of Fires', stretching across the regions of Campania, (2) Abruzzo and (3) Puglia, where illegal waste disposal and toxic waste fires threaten citizens' health and increase mistrust towards the institutions. Investigating the role of the antecedents of attitudes toward MSW separation in this area is particularly relevant for the identification of the most effective springboard upon which to build a social change program.

On one hand, it is important to study values in environmental concerns as a value reflects a belief on the desirability of a certain endstate, and values serve as a guiding principle for selecting or evaluating behaviours, people, and events. It has been theoretically reasoned and empirically validated that values are significant antecedents of specific beliefs and behaviours and can therefore be used as predictors for certain variables such as attitudes and behavioural intentions (Stern, 2000; Stern and Dietz, 1994). Values define or direct us to goals, frame our attitudes, and provide standards against which the behaviour of individuals and societies can be judged. Attitudes refer to the evaluation of a specific object, quality, or behaviour as good or bad, positive or negative. Attitudes are often influenced by an individual's personal values and value orientations (Barr, 2007; Maio et al., 2006; McCarty and Shrum, 1994; Hurst et al., 2013). In this vein, we suggest that value orientation predicts attitudes toward waste separation (e.g. de Groot and Steg, 2009; Steg et al., 2014). For instance, across 14 countries, universalism (positively), power (negatively), and tradition (negatively) predicted ecocentrism (Schultz and Zelezny, 1999).

Hypothesis 1. (H_1): egoistic values negatively predict the attitude toward waste separation; those participants endorsing more egoistic values, such as social power and wealth, have a negative attitude towards the behavior;

Hypothesis 2. (H_2): altruistic values positively relate to attitudes toward waste separation; those endorsing altruistic concerns should be more sensitive to the wellbeing of other people and want to protect the environment where people live;

Hypothesis 3. (H_3): biospheric values positively influence attitudes; those participants valuing the prevention of pollution and the preservation of the environment show a positive attitude toward waste separation.

On the other hand, the comprehensive Bamberg and Möser (2007) review included both elements from the TRA and from the VBN models. The social/subjective norm, the attitudes, the intention elements come from the TRA model, while problem awareness, internal attribution, feelings of guilt and moral norms derive from the VBN model. These authors have argued that pro-environmental behaviours are best conceptualised as behaviours that involve a combination of both self-interested and selfless motives; hence, they advocate the combination of rational choice theories with those that are more pro-socially motivated.

Knowledge and environmental problem awareness are important predictors of environmental concerns (e.g. Eriksson et al., 2006; Hansla et al., 2008). According to so-called "the deficit model" within the Public Understanding of Science (PUS), scientifically literate individuals are more competent in everyday life, better able to make informed decisions and scientific literacy is a prerequisite for effective democratic participation on issue of science and technology. Moreover, a scientifically literate public tend to be more supportive of a given technology (Wynne, 1995; Durant et al., 1989). However, the correlation between knowledge and attitudes has been the source of controversy in PUS research. In their review, Allum et al. (2008) found a small positive correlation between general attitudes towards science and general knowledge of scientific facts, after controlling for a range of possible confounding variables. As for public acceptance of renewable energy technologies, a correlation between knowledge and acceptance was found in two studies (DTI, Scottish Executive, 2003; MORI Social Research Institute for Regen South West, 2004), whereas a third study noted that levels of support were independent of levels of awareness, high or low (London Renewables, 2003). As for environmental issues, some studies found a positive relationship between public awareness and attitudes (Aminrad et al., 2013; Desa et al., 2011). Knowing what causes climate change was the most powerful predictor to vote on new government policies to reduce greenhouse gas emissions (Bord et al., 2000).

Hypothesis 4. (H_4): level of knowledge on waste separation and collection predicts positive attitudes towards the behaviour; those participants better informed about waste separation and collection in their area endorse a positive attitude towards recycling.

Generally speaking, internal attribution was found to influence personal norms, which in turn predict behavioural intentions (e.g. De Groot and Steg, 2009; Klöckner, 2013). Moreover, internal attribution was found to relate directly to behavioural intention. As shown in the review by Gifford and Nilsson (2014), internal locus of control has been associated with greater willingness to purchase ecological products in the U.S. (Schwepker and Cornwell, 1991) and to stronger pro-environmental intentions and behaviours in both Germany and Japan (Ando et al., 2010) as well as in Australia (Fielding and Head, 2012), including the use of cars for commuting in Canada (Abrahamse and Steg, 2009). Young people with higher environmental concerns and knowledge, and a more internal locus of control in relation to the environment, reported stronger pro-environmental intentions and behaviours (Fielding & Head, 2014).

Hypothesis 5. (H_{5a}) Internal attribution is related to attitudes toward waste separation, with those ascribing more responsibility for waste management crisis to themselves being more positive about the recycling; (H_{5b}) Internal attribution is related to behavioural intention, with those feeling more responsible being more willing to perform the behaviour; (H_{5c}) Attitudes mediate the effects of internal attribution on behavioural intention.

Social norms were viewed as a third factor influencing decisionmaking. In the TRA framework, a social norm was primarily conceptualised as a perceived social pressure, that is the expectation of significant reference persons to perform or not to perform a behaviour. Social norm was thought to determine behaviour not directly but only indirectly via its impact on intention. Reviews of TPB applications (e.g., Ajzen, 1991; Armitage & Conner, 2001) indicated that social norm often exerts no direct effect on intentions after checking for the effects of attitude. In this line, the Bamberg and Moser review (2007) and Kim et al. (2013) found that the variable of attitude acts as a mediator in the relationship between subjective norm and behavioural intention. Recent studies in the Italian context confirmed the predicted relations between social norms and behaviour intention (Carrus et al., 2008; Cembalo et al., 2019; Fornara et al., 2011)

Hypothesis 6. (H_{6a}) Social norms are related to attitude; those participants more sensitive to social pressures hold a more favourable attitude toward waste separation; (H_{6b}) Social norms are related to behaviour intention; higher participants' social norms related to waste separation predict a higher intention to perform the behaviour; (H_{6c}) Attitudes mediate the effects of social norms on the behavioural intention.

Also trust in public agencies could play a role in environmental behaviours (e.g. Wan et al., 2017). Political trust is generally defined as people's belief or confidence in the government that it will produce outcomes consistent with their expectations (Harring and Jagers, 2013; Zannakis et al., 2015), and it is recognized as a crucial factor that influences individuals' level of support for environmental policies. A trustworthy government can engender the public's willingness to comply with laws, to support government initiatives, and to follow political leadership without needing to be coerced (Warren, 1999). Kollmann and Reichl (2015) suggested that insufficient trust in governments and politicians is the root cause of people's reluctance to support environmental policy instruments. Konisky et al. (2008) found that more trusting individuals were more supportive of government action to address pollution problems and global issues. Nguyen et al. (2015) showed that individuals' trust is a decisive factor in their waste separation intentions. We investigated whether this was confirmed also in the three previously mentioned territories, where trust in the institutions has been challenged by centuries of misgovernment and mafia involvement in managing the public good.

Hypothesis 7. (H_7) political trust positively predicts attitudes towards MSW separation; more trusting individuals show a more positive attitude towards the behaviour.

In our proposed model, a set of motivations, namely egoistic, altruistic and biospheric values, and of cognitive/affective elements, such as awareness of the problem, the internal attribution and the social norms could influence attitudes toward the behaviour of MSW separation, which in

turn could predict behavioural intentions and eventually recycling behaviour (see Fig. 1). As predicted by TRA, attitudes towards the behaviour will be related to behavioural intention (e.g. Shen et al., 2019) (H_8), which in turn will predict the waste separation behaviours (e.g. Si et al., 2020) (H_9).

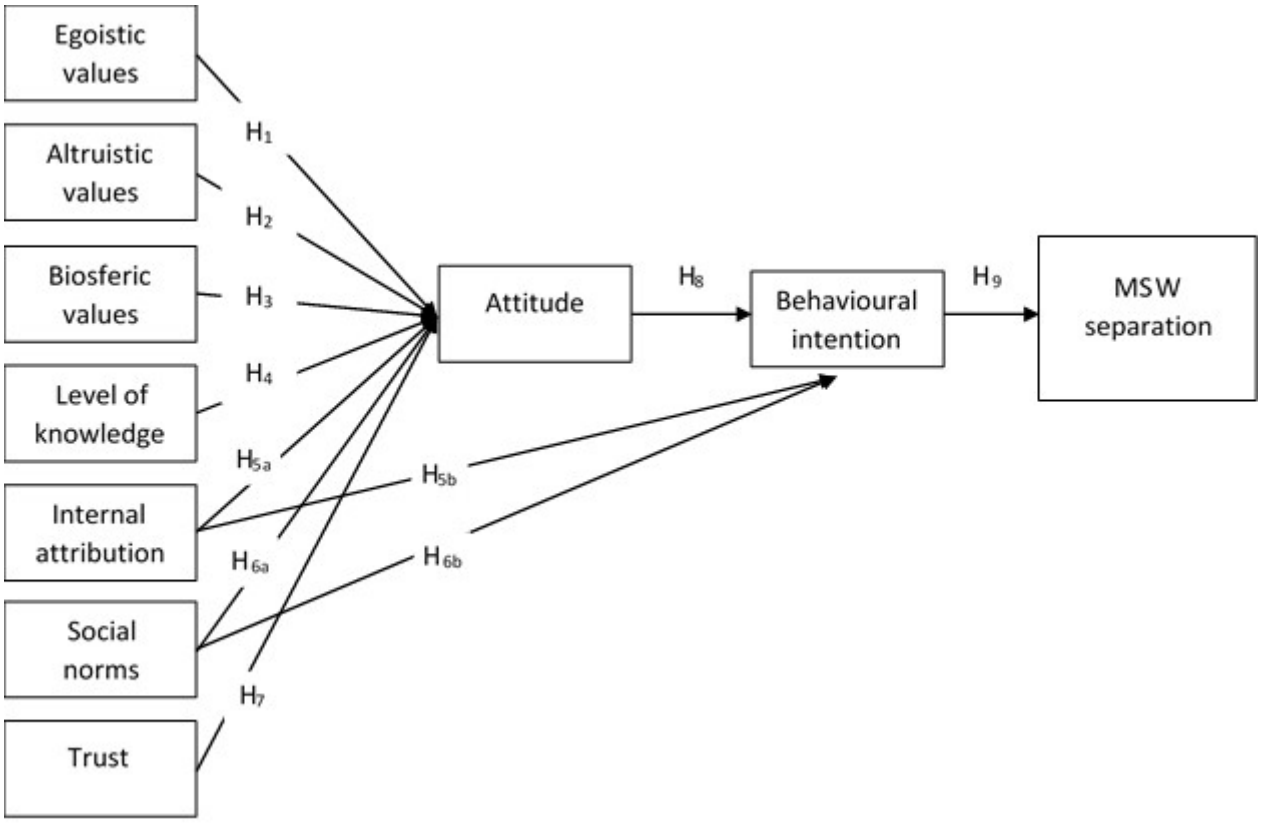

Figure 1. The hypothetical model for recycling behaviour

3. Methods

3.1.Participants

The sample included 313 participants (57.8 % women, missing=1), mean age 37 (SD=15.5; range 18–89), living in three southern Italian regions (mainly Campania 45.7 %, Puglia 28.4 % and Abruzzo 24 %). As regards occupation, approximately one third were students (N=114, 36.4 %), one third were employed (N=91, 29.1 %) and 44 were unemployed or housewives (14.1 %). As for marital status, about half of the sample was single (51.1 %) and 41.2 % was married/ lived with a partner.

Participants were recruited through a convenience sampling strategy (Etikan et al., 2016; Kerlinger, 1986), which included research assistants' and researchers' contacts as well as 'snowball' procedures (Biernacki and Waldorf, 1981). Convenience sampling is common practice in social sciences (Bornstein et al., 2013). To meet the entry criteria, participants had to be 18 or older and to be residing in a Southern region such as Campania, Puglia or Abruzzo for at least two years. Prospective participants were asked to fill in a written questionnaire "on environmental behaviours". Students enrolled in a Group Psychology course at the University of Chieti-Pescara were instructed to fill in one questionnaire and to administer three other questionnaires as follows: one to another student of the opposite sex and two questionnaires to two working or retired people (one male and one female). Most of the students enrolled at the University of Chieti-Pescara were originally from Southern Italian regions, thus belonging themselves to the population of interest. Moreover, participants were also recruited via snowball sampling with the collaboration of research assistants and postgraduate students. No reimbursement was granted for participation.

Convenience samples can also be conceptualized as heterogeneous convenience samples because, by design, the expectation is heterogeneity (i.e., diversity) in all sociodemographic factors. Bearing this in mind, candidates were approached across a broad spectrum relating to the topic of study. Sociodemographic characteristics of the sample, helping to evaluate the study sample's representativeness or generalizability (e.g., proportions of females and males, ages of participants, occupation and marital status), were reported in detail in the "Participants" section (Bornstein et al., 2013).

The questionnaire took approximately 20 min to complete. The research method complies with the norms of the Code of Ethics of the Italian Psychology Association (A.I.P., 2000).

3.2. Measures

The questionnaire included 42 items, divided into eight sections, one section for each dimension under investigation. Unless indicated otherwise, respondents rated those items on a 7-point scale ranging from 1 (= not at all) to 7 (= extremely) (see Table 2). The sections were as follows:

The dependent variable: the source separation behaviour: six items were selected to measure the behaviour; the participants were asked how often they performed a certain separation action (e.g. Schultz et al., 2005). Participants rated the items on a 4-point scale, ranging from 1 (never) to 4 (always).

Measures on the VBN approach:

Values: the measure of egoistic, altruistic and biospheric values (de Groot and Steg, 2008) were translated from English to Italian and backtranslated. This selection included 12 values: five items measured the egoistic values (e.g. social power), four items measured altruistic values (e.g. equality) and three items measured biospheric values (e.g. Respecting the Earth). Respondents rated the importance of these 12 values "as a guiding principle in their lives" on a 7-point scale ranging from 1 (= not important at all) to7 (= extremely important).

Level of knowledge: two items investigated participants' perception of their amount of knowledge about source separation and collection (e.g. Bamberg and Möser, 2007; De Feo, 2014).

Internal attribution: four items investigated the perception of being responsible for the environmental problems arising from waste disposal (e.g. Weiner, 2000).

Social Norms: four items explored whether and to what extent waste separation was shared among the participants' family members and friends (e.g. Ajzen, 1988; Schultz et al., 2008). We operationalized subjective norms as social norms, that is the extent to which someone would commit him/herself to recycling, if his/her friends/family members/acquaintances would do it. Thus, we renamed them as "social norms".

Trust in institutions: five items measured the level of trust in different actors of the recycling process such as the local administration, politicians, waste collectors (e.g. De Feo, 2014).

Measures on the TRA

Attitude towards the behaviour: five items assessed participants attitudes towards source separation (Tonglet et al., 2004; Visschers et al., 2016). Behaviour intention: four items measured the actual intention to implement the WSM separation at home or not (Knussen et al., 2004; Wan et al., 2012).

Basic sociodemographic information was obtained from each participant, including age, sex, marital status, education, profession, nationality, place of residence.

3.3. Data analysis

Thanks to LISREL 8.80 software, we tested a complete Structural Equation Model (SEM) (Jöreskog and Sörbom, 1996; Jöreskog et al., 2001), including 7 exogenous latent variables (i.e. egoistic values, altruistic values, biospheric values, level of knowledge, internal attribution, social norms, trust in institutions), 3 endogenous latent variables (i.e. attitude, behavioural intention, MSW separation), 27 observed X variables (27 items pointing to exogenous latent variables) and 15 observed Y variables (15 items pointing to endogenous latent variables). In the hypothesized model (See Fig. 1), egoistic, altruistic and biospheric values, the level of knowledge, internal attribution, social norms and trust in institution are exogenous latent variables (independent ones), while attitude towards waste separation, behaviour intention and waste separation behaviour are endogenous latent variables (dependent ones).

Being the observed X and Y variables an ordinal scale (Likert), the polychoric correlation matrix as the input data was used, weighted by the asymptotic covariance matrix. Since the multivariate normality in observed variables is not satisfied, we used Robust Unweighted Least Squares (RULS) as the method of estimation (Morata-Ramirez, and Holgado-Tello 2013). As for the model fit indexes, we considered RMSEA, NFI, NNFI and CFI (Hu and Bentler, 1999).

4. Results

4.1. Preliminary analysis

Descriptive statistics and reliabilities of the 10 dimensions are shown in Table 1. Following Crutzen and Peters (2017) and Peters (2014) concerning the reliability of ordinal scales, we computed the ordinal Cronbach's Alpha (Gadermann et al., 2012), the ordinal Omega (total) (ωt) (McDonald, 1978) and the ordinal Omega (hierachical) (ωh) (McDonald, 1999) via the polychoric correlation matrix using the package 'userfriendlyscience' (Peters, 2015) of the source package R (R Development Core Team, 2014). Since the "level of knowledge" dimension is made of two items, it was not possible to compute the "ordinal" indexes listed above. In this case, the Pearson correlation coefficient was reported. All the dimensions reached an acceptable reliability coefficient of .7 and level of knowledge dimension achieved a strong correlation (.54).

Recycling behaviours and behavioural intentions were highly correlated among them and with every other study variable, with the exception of egoistic values. Attitudes toward MSW separation correlated with all the study variables, with the exception of egoistic values and trust in institutions. Egoistic values do not relate to any other variables.

Table 1.
Mean, standard deviation, Cronbach Alpha, Ordinal Omega (total), Pearson correlation coefficient (for Level of Knowledge) and correlation matrix among study variables

	1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*	*8.*	*9.*	*10.*
1. Egoistic Values	1									
2. Altruistic Values	.021	1								
3. Biospheric values	-.05	.49**	1							
4. Level of knowledge	-.10	.07	.23**	1						
5. Internal Attribution	-.01	.10	.15**	.15**	1					
6. Social Norms	-.05	.20**	.41**	.39**	.19**	1				
7. Trust in institutions	-.04	.10	.14*	.31**	.17**	.33**	1			
8. Attitude	-.1	.20**	.29**	.30**	.22**	.35**	.09	1		
9. Behaviour Intention	-.03	.33**	.43**	.30**	.40**	.43**	.23**	.54**	1	
10.MSW separation	-.04	.22**	.33**	.46**	.25**	.37**	.28**	.37**	.42**	1
Mean	3.94	6.36	6.46	4.34	3.90	5.93	3.81	5.97	5.68	2.31
SD	1.23	.66	.65	1.61	1.32	.82	1.05	.83	.92	.50
Ordinal Cronbach's Alpha	.78	.79	.85	/	.71	.77	.66	.71	.66	.72
Ordinal ω_t	.78	.79	.85	/	.73	.78	.70	.72	.67	.72
Ordinal ω_h	.78	.79	.84	/	.72	.77	.69	.72	.66	.72

Pearson correlation coefficient	.54

Note: **p < .01.; *** p < .001

4.2. Structural equation modelling (SEM)

The results of the full Lisrel model indicated a good model fit, with Satorra-Bentler Scaled Chi^2 (787; n=313)=1521.3, and other fit indices were acceptable RMSEA=.06, NFI=.89, NNFI=.94 and CFI=.94, following Schermelleh-Engel et al. (2003) (see Fig. 2).

In full Lisrel models, it is possible to perform at the same time Confirmatory Factor Analysis (CFA) to assess construct validity of study measures, and to test "causal" model to investigate whether, and to what extent, the collected data fit the hypothesised relationships between study measure within the model. CFA explicitly tests a hypothesized measurement model (as opposed to an exploratory approach), accounts for sources of common measurement and method error that are inherent in survey research, and provides empirical justification. In other words, CFA was mainly applied to determine the goodness of fit between measurement items in the scale. Lambda matrix X and Y provide factors loadings confirming the hypothesized factorial structure (Tables 2 and 3).

As for the "causal" model, this tests the degree to which collected data fit the expected relationship between study variables. The causal model explains 50 % of variance of the attitude toward waste separation (R^2=.50). Variables contributing to the attitudes are internal attribution (Υ=.24), thus H_{5a} was supported; social norms (Υ=.25), thus H_{6a} was supported; and level of knowledge (Υ=.22), thus H_4 was supported, and, to a lesser extent, altruistic values (Υ=.20), thus H_2 was supported. Biospheric values (Υ=.13), egoistic values (Υ = -.09) and trust in institution (Υ = -.15) showed limited contribution to the prediction of the attitude not supporting H_3, H_1, H_7. Moreover, internal attribution predicted behavioural intention (Υ = .25), thus H_{5b} was supported. Social norms predicted behavioural intention (Υ = .38), thus H_{6b} was supported. Direct effect of attitudes on behaviour intention is very strong (β = .71), supporting H_8, as well as the latter's impact on MSW separation behaviour (β= .72), confirming H_9. In sum, the total model explains 97 % of the variance for behaviour intention (R^2=.97) and the 50 % of variance for source separation (R^2 =.50).

4.3. Mediation analysis

Finally, we examined the mediating role of the attitudes between internal attribution and behavioural intention and between social norms and behavioural intention. Since MacKinnon et al. (2002) have shown that the method used by LISREL to calculate the standard error of the indirect effect tends to yield incorrect estimates, we used a bootstrapping procedure (Hayes, 2017; Preacher and Hayes, 2008; Shrout and Bolger, 2002) for estimating direct and indirect effects. The independent variable should be related to the mediator variable, and the mediator variable to the dependent variable. After that, full mediation occurs when a non-significant Direct Effect from the independent variable to the dependent variable is present with a significant indirect path; partial mediation takes place when both the Indirect Effect and the Direct Effect are significant (Zhao et al., 2010). An Indirect Effect is significant when its confidence interval does not cross zero. The indirect effect reflects the amount by which the total effect of the independent variable (i.e. internal attribution) is decreased when the mediator (i.e. attitude) is introduced in the analysis (Sperry and Widom, 2013).

For the mediating role of attitudes between internal attribution and behavioural intention, in Step 1 of the mediation model, the regression of internal attribution on behavioural intention, ignoring the mediator, was significant, b=.27, t(311)=7.63, p < .001. Step 2 showed that the regression of internal attribution on the mediator, attitude towards the behaviour, was also significant, b=.13, t(311)=3.76, p < .001. Step 3 of the mediation process showed that the mediator (attitude), controlling for internal attribution, was significant, b=.51, t (310)=10.06, p < .001. Step 4 of the analysis revealed that, controlling for the mediator (attitude), internal attribution was still a significant predictor of behavioural intention, b=.21, t(301)=6.48, p < .001. A Sobel test was conducted and found partial mediation in the model (z=3.51, p < .001), thus supporting H_{5c}.

We also examined the mediating role of the attitudes between social norms and behavioural intention. In Step 1 of the mediational model, the regression of social norms on behavioural intention, ignoring the mediator, was significant, b=.45, t(311)=7.79, p < .001. Step 2 showed that the regression of social norms on the mediator, attitude towards the behaviour, was also significant, b=.33, t(311)=6.17, p < .001. Step 3 showed that the mediator (attitude), controlling for social norm, was significant, b=49, t(310)=9.05, p < .001. Step 4 of the analysis revealed that, controlling for the mediator (attitude), social norms were still significant predictors of behavioural intention, b=.29, t(310)=5.27, p < .001. A Sobel test found partial mediation in the model (z=5.08, p < .001), thus supporting H_{6c}.

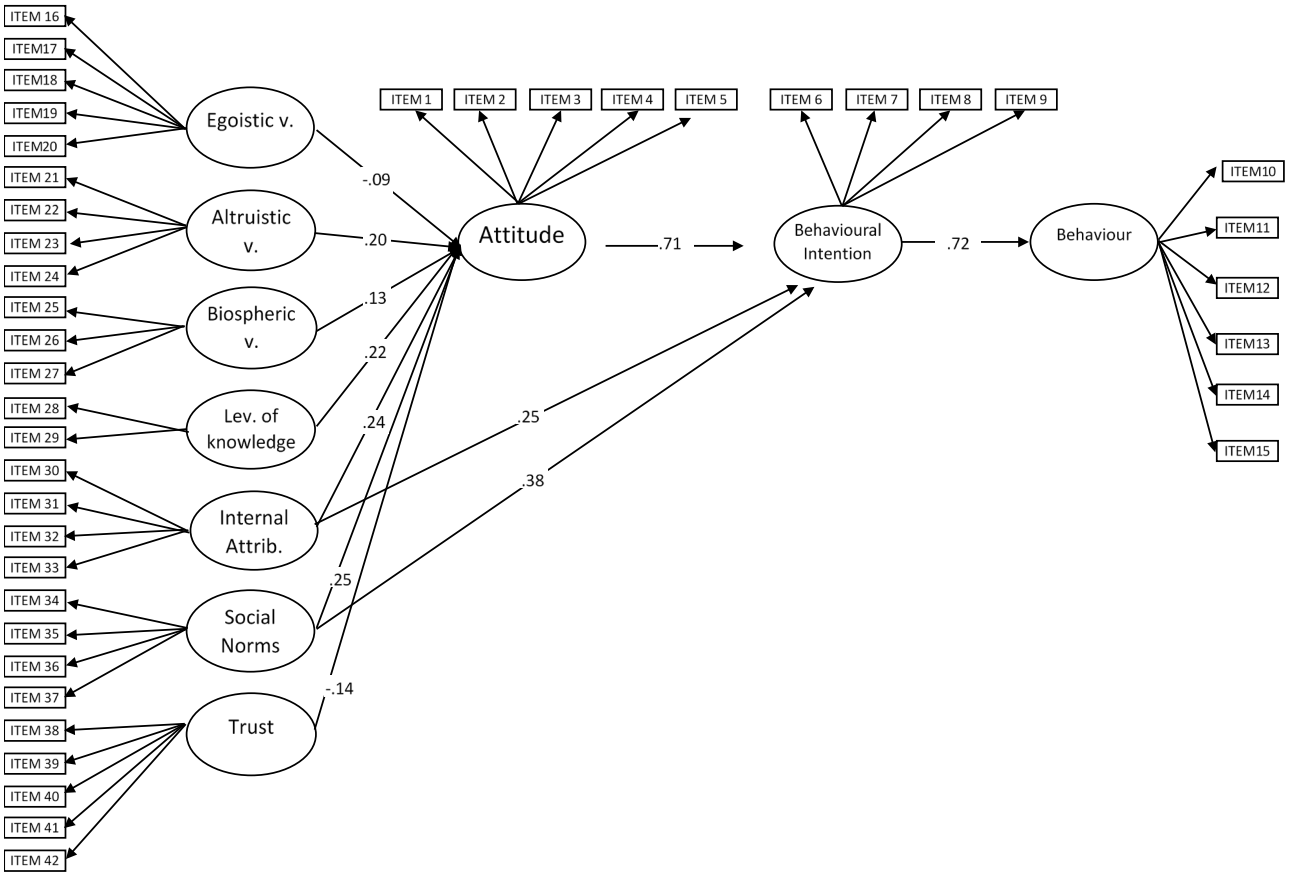

Figure 2. Standardized solution

5. Discussion

This exploratory study investigated the psychosocial factors involved in promoting a specific pro-environmental behaviour, namely MSW separation, in three territories in Southern Italy. Our hypothetical model merged the fundamental elements of TRA together with de Groot and Steg's (2008) validated measures of egoistic, altruistic and biospheric values (Steg et al., 2014; Bamberg and Möser, 2007).

In our view, our study presents three novelties. First of all, many attempts have been made to reconcile the two approaches (i.e. TRA and VBN; e.g. Zhang et al., 2015), but, to our knowledge, this is the first attempt to investigate both psychosocial factors derived from the TRA and derived from the VBN predicting the intention to recycle in a specific territory, namely Southern Italy, where the percentage of separated MSW is particularly low and the waste management crisis is far from being solved. To our knowledge, only one study, i.e. Carrus et al. (2008), has tested the predictions of the TPB (but not the TRA) concerning waste separation in the Land of Fires and no study has tried to incorporate the TRA and VBN in predicting MSW separation in the Southern Italy. We are aware that the waste management crisis in southern Italy has not only to do with the alleged inability of Campania's inhabitants to implement efficient waste separation programs (D'Alisa et al., 2010). However, promoting the MSW separation in southern Italian regions is one of the first steps towards building an efficient waste management system.

We pursued this objective by running a full Lisrel model. The results of full SEM revealed that the overall goodness of fit for the hypothesis model is good, indicating at the same time that (1) CFA has found a good fit between measurements items in the scale, and (2) the "causal" hypothesized model fits the measured relationships between study variables. As for CFA, we provided evidence of the goodness of items in measuring latent variables and we provided some preliminary evidence for the internal validity of the Italian translation of de Groot and Steg's values scale.

Moreover, as for the causal model, the findings confirmed the hypothesized relationships between study variables (see Fig. 1). Internal attribution and social norms were the strongest predictors of the attitude. Attitude strongly predicted the behavioural intention, which in turn predicted the pro-environmental behaviour (i.e. source separation) (Cembalo et al., 2019). As for values, only altruistic values predicted attitudes, while biosferic and egoistic values only weakly predicted attitude. Our results confirmed the role played by both psychosocial variables derived from the VBN, such as internal attribution, and variables derived from the TRA, such as social norms and attitudes in predicting MSW separation. This is in line with the results by Best and Mayerl (2013) and by Bortoleto et al. (2012), in that it is crucial to emphasize the fact that the measured attitude is embedded in a larger structure of environmental cognitions. The role played by TRA is in line with the results by Oreg and Katz-Gerro (2006), who also provided a cross-national validation of the TPB model in a twenty-seven country sample. Our results are also in line with those by Aguilar-Luzón et al. (2012), who found that the TPB model has a greater degree of fit and greater capacity to predict source separation behaviour than the VBN model. As for social norms, they are determined by beliefs regarding what relatives, friends and significant others think of the behaviour as well as one's motivation to comply with them. On the one hand, the predictive role played by social norms in our data confirms the study by Carrus et al. (2008) in Italy, who found that attitude and social norms significantly predict the inclination to MSW separation. This is also in line with the meta-analysis by Bamberg and Möser (2007), who found that social norms, viewed as perceived social pressure/expectations of significant others to perform a given behaviour, affect people's proenvironmental intentions. Recently, Mintz et al. (2019) found that social norms were a strong predictor of recycling among Israeli, Japanese and German students. On the other hand, our results do not replicate those of Mannetti et al. (2004), who found a weak impact of subjective norms on attitudes towards recycling, in a sample of university students in central Italy (i.e. the Rome area). Moreover, it was found that attitude partially mediated the relationship between social norms and behavioural intentions, thus clarifying the role of attitudes. This is consistent with the results of Kim et al. (2013) in that attitude acted as a mediator in the relationship between subjective norm and behavioural intention to read menu labels in the restaurant industry. This dimension definitely calls for further investigation, as following Cialdini and Trost (1998), those who want to trigger socially beneficial behaviour should use procedures that activate "injunctive" social norms, as they are more cross-situationally effective than descriptive norms. "Injunctive norms" are characterised by the perception of what most people approve or disapprove of. Hence, if carrying out

proper MSW separation at home were to become an injunctive norm, then southern Italian inhabitants would be more involved in such a behaviour, waiting for social rewards in terms of popularity and social acceptance.

Stemming from the VBN theory, the internal attribution was a strong predictor of attitudes toward source separation. People who felt responsible for the waste situation in South Italy were those most committed to separation. This is in line with the prediction of the VBN approach and confirms the results of Bamberg and Möser's meta-analysis (2007). Given these promising preliminary results and the paucity of studies on the role played by ascribing responsibility to oneself, future research could explore the role played by emotions such as guilt, as elicited by negative behaviours, in influencing pro-environmental behaviour. For instance, the internal attribution of a behaviour damaging the environment could trigger emotional reactions such as guilt feelings (Pivetti et al., 2016). Moreover, it was found that attitudes partially mediated the relationship between internal attribution and behavioural intention. This is consistent with previous literature that states that internal attribution weakly predicts environmental attitudes, which in turn predicts behavioural intention.

Our results underline the role of the knowledge of the waste emergency as a third important direct predictor of attitudes towards recycling. Problem awareness was originally evoked by Stern et al. (1985), and it has been shown to be an important antecedent for proenvironmental behavioural intentions and behaviour (de Groot and Steg, 2009; Nordlund and Garvill, 2003). In their view, problem awareness should trigger a personal norm or a perceived moral obligation to act in order to protect the environment. The personal norm is considered to be derived from general and environmental values. In our model, problem awareness and biospheric values are independent direct predictors of the environmental attitude, so we aimed to test the role played by each determinant independently in influencing environmental attitude. Moreover, Fielding and Head (2012) indicated that people with higher environmental knowledge and a more internal locus of control in relation to the environment, reported stronger proenvironmental intentions and behaviour, and less environmentally harmful behaviour.

Contrary to our hypotheses, egoistic values were uninfluential in predicting attitudes toward recycling. Southern Italians committed themselves to source separation whether they were more egoistically oriented or not. One possible explanation is that MSW separation was unrelated to egoistic values, which were poorly endorsed by participants. The latter were perhaps more concerned with the safeguarding of the environment, their health and family members' well-being.

The second novelty of the study relies in the investigation of the role of trust in institutions, based on previous research showing that citizens' trust in government actions (Nguyen et al., 2015; Konisky et al., 2008) were good predictors of waste separation programs. Also Harring et al. (2019) found support for a positive link between generalized trust, institutional trust, and institutional quality as a country-level factor on reported household recycling. In Southern Italy, De Feo (2014) showed that trust in the local authority played a pivotal role in the success of a separate collection program. In our results, trust was a weak predictor of attitudes toward recycling. One possible explanation relies on the type of trust we measured, i.e. trust in abstract agencies such as "scientific community," "local administration," "local politicians." Even if confirmatory factor analysis was satisfactory showing that those items contribute to the latent factor "trust in institutions," participants might have perceived their trust in those agencies as being too abstract to really have an impact on their collective behaviours, such as source separation. It is necessary to consider that trust in different social institutions has a distinctive association with environmental concerns. A review based on 27 empirical studies revealed that this field of research suffers from a lack of consistency in conceptualising 'trust' (Chryssochoidis et al., 2009; Xiao and McCright, 2015). Moreover, as Tsai (2008) argues, recycling behaviour is not just an individual matter, but rather a collective action, which can therefore be impacted by social capital. According to Tsai's research, social capital has a significant impact on recycling behaviour on the local level in Taiwan, if the proxy used for social capital is participation in voluntary organizations. Therefore, she argues that recycling is enhanced by community involvement such as membership in organizations and local voluntary networks. The importance of social capital in waste management is also discussed by Jones et al. (2011) with reference to Greece. They find that social capital in the form of institutional and social trust, networks and compliance with social norms impact people's participation in voluntary recycling activities. For example, institutional trust in management encourages individuals to play their part as it is expected that waste management will be efficient, while social trust enhances confidence in the fact that others are also recycling properly.

5.1. Policy implications

The third novelty of the study lies in providing public administrators with a practical checklist for the improvement of source separation in difficult territories. Based on our exploratory model, the most important stimuli for improving source separationbehaviour in southern Italy are:

- spreading social norms on appropriate source separation behaviour;
- fostering the internal attributions of the environmental emergency of the "land of fires;"
- sharing an awareness of the "Land of Fires" crisis.

Those factors would promote more positive attitudes toward source separation, which in turn would influence a behavioural intention, enabling separated collection. This is also consistent with the results of the meta-analysis by Osbaldiston and Schott (2012), who found that the most effective treatments for promoting recycling were social modelling, apart from making it easy, and rewarding. Our results are also consistent with the review by Steg et al. (2014) who indicated that normative goals should be strengthened to encourage pro-environmental behaviour, making the clash between normative and the hedonic and gain goals less prominent. This approach could make people focus on the environmental consequences of behavioural options and foster pro-environmental actions, even though such actions may come at some personal cost. Moreover, the visibility of source separation, and 'social pressures' exerted by the knowledge that others recycle, could have a positive effect on recycling behaviour and enable new norms to be established (Thomas and Sharp, 2013). In addition to this, our results replicate those by Miliute-Plepiene et al. (2016), who showed that facilitators of moral norms were the behaviour of other households (i.e. the belief that other households sorted their packaging waste), environmental awareness (i.e. the belief that not sorting had negative consequences), and trust in the system (i.e. the belief that one's efforts were not in vain, in that sorted waste would indeed be recycled).

Moreover, Agovino et al. (2018) investigated the waste management performance of Italian provinces in the period 2004–2011. They found that, in the long-run, the joint action on the part of local institutions and citizens can reduce the gap between "good" and "bad" provinces in source separation, inducing convergence towards better waste management performance. Their findings suggest that waste management process is optimised when citizens and local government jointly adopt appropriate behaviour

5.2. Study limitations

As regards the many limitations of the study, we used a self-reported measure for source separation behaviours, while no objective measure was collected. Even if this practice is quite common, we recognise that participants' responses might have been influenced by social desirability. However, in literature, self-reported measures, fallible as they may be, seems to predict more pro-environmental behaviour (e.g., Fielding and Head, 2012).

Another study limitation is that most of the measures were developed for the first time by the authors based on previous research, and were not previously validated, apart from the measures of egoistic, altruistic and biospheric values (de Groot and Steg, 2008). However, in the study, we provided satisfactory confirmatory factor analysis to validate the used measures. The validation of a standardized tool to predict attitude and behavioural intention towards source separation in Italy is beyond the scope of this study. This exploratory study aims to propose a model predicting pro-environmental behaviour, namely MSW separation in South Italy. Further research is needed to confirm this model. Convergent validity and discriminant validity of the model need to be addressed in future research.

We are aware that the use of convenience sampling also means that our sample was not necessarily representative of Southern Italians in general. Even if convenience sampling is common practice in social sciences (Bornstein et al., 2013), future research should involve a larger and more representative sample of the population in the involved territories.

To ensure heterogeneity, candidates were approached across a broad spectrum relating to the topic of study. During data collection, response rates and non-response biases were addressed in multiple ways: 1) trained postgraduate students were aware of the importance of heterogeneity in data collection; during data collection, they were advised to administer three other questionnaires as follows: one to another student of the opposite sex and two questionnaires to two working or retired persons (one male and one female); 2) personal communications and telephone reminders were sent to non- or late respondents to increase the response rate and mitigate the nonresponse bias. The questionnaire comprised 42 items and participants' fatigue could contribute to returning an incomplete questionnaire. To address item non-responses, trained postgraduate students and research assistants administering the questionnaires stressed the importance of answering each item of the questionnaire carefully. Moreover, willingness to complete a questionnaire is often linked to the perceived relevance of the survey to the participants' personal experiences. We consider source separation as a relevant issue for the inhabitants of Southern regions who experience difficulties in having their garbage removed from the dumpsters on the streets and for those who are exposed to illegal toxic fires. After the data collection, returned questionnaires with more than 30 % of items unanswered were discarded from the sample, in line with common practice in quantitative research. After the discard, missing values still present were replaced with the median of each item. This procedure is common in data analysis with LISREL.

Therefore, the dimension perceived behavioural control (PBC), that is the perception of the capability to perform and the controllability of a behaviour, was not included in the study based on the idea that waste management is organized independently by each municipality. Great differences in the efficacy of the process emerges from town to town, leading to confusion in the interpretation of the results.

Future research should explore the concept of perception of fairness in supporting social policies and civic engagement. People will support a public policy that provides no individual benefit if they regard the policy as being fair (Smith and Tyler, 1996). Both procedural fairness and outcome fairness should be considered as important for the approval of policies. For instance, if local authorities lend no voice to local communities in regard to waste management in the area, then procedural fairness is not met and the potential for loss of public trust in the institution seems large (Petts, 2008). This is also consistent with the call for increased transparency and community involvement in the decisionmaking process (D'Alisa et al., 2010).

CRediT authorship contribution statement

Monica Pivetti: Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing, Visualization, Supervision. Giannino Melotti: Formal analysis, Writing - original draft, Writing - review & editing. Mariangela Vespa: Conceptualization, Investigation, Resources, Data curation. Francesca Cappabianca: Conceptualization, Investigation, Resources, Data curation. Fabio Troilo: Conceptualization, Investigation, Resources, Data curation. Matteo Pio Placentino: Conceptualization, Investigation, Resources, Data curation.

Declaration of Competing Interest

None.

References

ABR24 News, 26 February 2018, 2018. L'Italia della Terra dei Fuochi, un sistema pluridecennale a cui e' tutto tranne che immune anche l'Abruzzo. Available from http://www.antimafiaduemila.com/home/terzo-millennio/232-crisi/69230-l-italia-dellaterra-dei-fuochi-un-sistema-pluridecennale-a-cui-e-tutto-tranne-che-immune-anche-labruzzo.html.

Abrahamse, W., Steg, L., 2009. How do socio-demographic and psychological factors relate to households' direct and indirect energy use and savings? J. Econ. Psychol. 30 (5), 711–720. https://doi.org/10.1016/j.joep.2009.05.006.

Agovino, M., D'Uva, M., Garofalo, A., Marchesano, K., 2018. Waste management performance in Italian provinces: efficiency and spatial effects of local governments and citizen action. Ecol. Indic. 89, 680–695.

Agovino, M., Musella, G., 2020. Separate waste collection in mountain municipalities. A case study in Campania. Land Use Policy 91, 104408. https://doi.org/10.1016/j.landusepol.2019.104408.

Aguilar-Luzón, M.D.C., García-Martínez, J.M.Á., Calvo-Salguero, A., Salinas, J.M., 2012. Comparative study between the theory of planned behaviour and the value–belief–norm model regarding the environment, on Spanish housewives' recycling behaviour. J. Appl. Soc. Psychol. 42 (11), 2797–2833. https://doi.org/10.1111/j.1559-1816.2012.00962.x.

Ajzen, I., 1985. From intentions to actions: a theory of planned behavior. Action control. Springer, Berlin, Heidelberg, pp. 11–39. https://doi.org/10.1007/978-3-642-69746-3_2.

Ajzen, I., 1988. Attitudes. Person. Behav.

Ajzen, I., 1991. The theory of planned behavior. Org. Behav. Hum. Decis. Process. 50 (2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T.

Allum, N., Sturgis, P., Tabourazi, D., Brunton-Smith, I., 2008. Science knowledge and attitudes across cultures: a meta-analysis. Public Underst. Sci. 17 (1), 35–54. https://doi.org/10.1177/0963662506070159.

Aminrad, Z., Zakariya, S.Z.B.S., Hadi, A.S., Sakari, M., 2013. Relationship between awareness, knowledge and attitudes towards environmental education among secondary school students in Malaysia. World Appl. Sci. J. 22 (9), 1326–1333.

Ando, K., Ohnuma, S., Blöbaum, A., Matthies, E., Sugiura, J., 2010. Determinants of individual and collective pro-environmental behaviors: comparing Germany and Japan. J. Environ. Inform. Sci. 38 (5), 21–32.

Armiero, M., 2008. Seeing like a protester: nature, power, and environmental struggles. Left History 13 (1), 59–76.

Armitage, C.J., Conner, M., 2001. Efficacy of the theory of planned behaviour: a metaanalytic review. Br. J. Soc. Psychol. 40 (4), 471–499. https://doi.org/10.1348/014466601164939.

Árnadóttir, Á.D., Kok, G., Van Gils, S., Ten Hoor, G.A., 2019. Waste separation in cafeterias: a study among university students in the Netherlands. Int. J. Environ. Res. Public Health 16 (1), 93. https://doi.org/10.3390/ijerph16010093.

Associazione Italiana di Psicologia, A.I.P, 2000. Code of Ethics of the Italian Psychological Association. Available from http://www.aipass.org/node/26 [Accessed 10 January 2015]. .

Bamberg, S., Möser, G., 2007. Twenty years after Hines, Hungerford, and Tomera: a new meta-analysis of psycho-social determinants of pro-environmental behaviour. J. Environ. Psychol. 27 (1), 14–25. https://doi.org/10.1016/j.jenvp.2006.12.002.

Barbieri, R., Piglionica, D., 2007. Commissione parlamentare d'inchiesta sul ciclo dei rifiuti e sulle attività illecite ad esso connesse. Parliamentary report. . Available at: www.camera.it/_dati/leg15/lavori/documentiparlamentari/indiceetesti/023/002_S/pdfel.htm.

Barr, S., 2007. Factors influencing environmental attitudes and behaviors: a UK case study of household waste management. Environ. Behav. 39 (4), 435–473. https://doi.org/10.1177/0013916505283421.

Best, H., Mayerl, J., 2013. Values, beliefs, attitudes: an empirical study on the structure of environmental concern and recycling participation. Soc. Sci. Quart. 94 (3), 691–714. https://doi.org/10.1111/ssqu.12010.

Biernacki, P., Waldorf, D., 1981. Snowball sampling: problems and techniques of chain referral sampling. Soc. Methods Res. 10 (2), 141–163. https://doi.org/10.1177/004912418101000205.

Bord, R.J., O'Connor, R.E., Fisher, A., 2000. In what sense does the public need to understand global climate change? Public Underst. Sci. 9 (3), 205–218. https://doi.org/10.1088/0963-6625/9/3/301.

Bornstein, M.H., Jager, J., Putnick, D.L., 2013. Sampling in developmental science: Situations, shortcomings, solutions, and standards. Dev. Rev. 33 (4), 357–370. https://doi.org/10.1016/j.dr.2013.08.003.

Bortoleto, A.P., Kurisu, K.H., Hanaki, K., 2012. Model development for household waste prevention behaviour. Waste Manag. 32 (12), 2195–2207. https://doi.org/10.1016/j.wasman.2012.05.037.

Carrus, G., Passafaro, P., Bonnes, M., 2008. Teoria del Comportamento Pianificato e norme locali: uno studio sulla raccolta differenziata dei rifiuti domestici. Rassegna di Psicologia 25, 27–43.

Cembalo, L., Caso, D., Carfora, V., Caracciolo, F., Lombardi, A., Cicia, G., 2019. The "land of fires" toxic waste scandal and its effect on consumer food choices. Int. J. Environ. Res. Public Health 16 (1), 165. https://doi.org/10.3390/ijerph16010165.

Centre for sustainable systems, 2013. Municipal Solid Waste Factsheet. University of Michigan.

Chan, L., Bishop, B., 2013. A moral basis for recycling: extending the theory of planned behaviour. J. Environ. Psychol. 36, 96–102. https://doi.org/10.1016/j.jenvp.2013.07.010.

Chryssochoidis, G., Strada, A., Krystallis, A., 2009. Public trust in institutions and information sources regarding risk management and communication: towards integrating extant knowledge. J. Risk Res. 12 (2), 137–185. https://doi.org/10.1080/13669870802637000.

Cialdini, R.B., Trost, M.R., 1998. Social influence: social norms, conformity and compliance. In: In: Gilbert, D.T., Fiske, S.T., Lindzey, G. (Eds.), Handbook of Social Psychology 2. McGraw-Hill, New York, pp. 151–192.

Crutzen, R., Peters, G.J.Y., 2017. Scale quality: alpha is an inadequate estimate and factor-analytic evidence is needed first of all. Health Psychol. Rev. 11 (3), 242–247. https://doi.org/10.1080/17437199.2015.1124240.

D'Alisa, G., Burgalassi, D., Healy, H., Walter, M., 2010. Conflict in Campania: waste emergency or crisis of democracy. Ecol. Econ. 70 (2), 239–249. https://doi.org/10.1016/j.ecolecon.2010.06.021.

De Cremer, D., Snyder, M., Dewitte, S., 2001. 'The less I trust, the less I contribute (or not)?'The effects of trust, accountability and self-monitoring in social dilemmas. Eur. J. Soc. Psychol. 31 (1), 93–107. https://doi.org/10.1002/ejsp.34.

De Feo, G., 2014. Sociological survey in a municipality with a high level separate collection programme in an area of historic unpopularity. Waste Manag. 34 (8), 1369–1380. https://doi.org/10.1016/j.wasman.2014.02.009.

De Feo, G., De Gisi, S., 2010. Using an innovative criteria weighting tool for stakeholders involvement to rank MSW facility sites with the AHP. Waste Manag. 30 (11), 2370–2382. https://doi.org/10.1016/j.wasman.2010.04.010.

De Groot, J.I., Steg, L., 2008. Value orientations to explain beliefs related to environmental significant behaviour: how to measure egoistic, altruistic, and biospheric value orientations. Environ. Behav. 40 (3), 330–354. https://doi.org/10.1177/0013916506297831.

De Groot, J.I., Steg, L., 2009. Morality and prosocial behaviour: the role of awareness, responsibility, and norms in the norm activation model. J. Soc. Psychol. 149 (4), 425–449. https://doi.org/10.3200/SOCP.149.4.425-449.

De Medici, G., 2007. L'emergenza rifiuti in Campania la questione dei siti. Bollettino delle Assise 12, 6–7.

Di Maria, F., Mersky, R.L., Daskal, S., Ayalon, O., Ghosh, S.K., 2020. Preliminary comparison among recycling rates for developed and developing countries: the case of India, Israel, Italy and USA. Sustainable Waste Management: Policies and Case Studies. Springer, Singapore, pp. 1–13.

Desa, A., Kadir, N.B.Y.A., Yusooff, F., 2011. A study on the knowledge, attitudes, awareness status and behaviour concerning solid waste management. Proc. Soc. Behav. Sci. 18, 643–648. https://doi.org/10.1016/j.sbspro.2011.05.095.

DTI, Scottish Executive, 2003. Attitudes and Knowledge of Renewable Energy amongst the General Public. Report Findings. DTI, Scottish Executive.

Durant, J.R., Evans, G.A., Thomas, G.P., 1989. The public understanding of science. Nature 340 (6228), 11–14. https://doi.org/10.1038/340011a0.

Eriksson, L., Garvill, J., Nordlund, A.M., 2006. Acceptability of travel demand management measures: the importance of problem awareness, personal norm, freedom, and fairness. J. Environ. Psychol. 26 (1), 15–26. https://doi.org/10.1016/j.jenvp.2006.05.003.

Etikan, I., Musa, S.A., Alkassim, R.S., 2016. Comparison of convenience sampling and purposive sampling. Am. J. Theor. Appl. Stat. 5 (1), 1–4. https://doi.org/10.11648/j.ajtas.20160501.11.

Fielding, K.S., Head, B.W., 2012. Determinants of young Australians' environmental actions: the role of responsibility attributions, locus of control, knowledge and attitudes. Environ. Educ. Res. 18 (2), 171–186. https://doi.org/10.1080/13504622.2011.592936.

Fishbein, M., Ajzen, I., 1980. Understanding Attitudes and Predicting Social Behavior. Prentice Hall.

Fornara, F., Carrus, G., Passafaro, P., Bonnes, M., 2011. Distinguishing the sources of normative influence on proenvironmental behaviors: the role of local norms in household waste recycling. Group Process. Intergr. Relat. 14 (5), 623–635. https://doi.org/10.1177/1368430211408149.

Fontana, E., Pergolizzi, A., Ruggiero, P., Dodaro, F., Groccia, C., Ciafani, S., Del Giudice, R., 2008. Rifiuti Spa. Legambiente. Available online at:. http://www.borsarifiuti.com/materiali.phpsc.

Gadermann, A.M., Guhn, M., Zumbo, B.D., 2012. Estimating ordinal reliability for Likerttype and ordinal item response data: a conceptual, empirical, and practical guide. Pract. Assess. Res. Eval. 17, 1–13.

Gifford, R., Nilsson, A., 2014. Personal and social factors that influence pro-environmental concern and behaviour: a review. Int. J. Psychol. 49 (3), 141–157. https://doi.org/10.1002/ijop.12034.

Greaves, M., Zibarras, L.D., Stride, C., 2013. Using the theory of planned behaviour to explore environmental behavioural intentions in the workplace. J. Environ. Psychol. 34, 109–120. https://doi.org/10.1016/j.jenvp.2013.02.003.

Hansla, A., Gamble, A., Juliusson, A., Gärling, T., 2008. The relationships between awareness of consequences, environmental concern, and value orientations. J. Environ. Psychol. 28 (1), 1–9. https://doi.org/10.1016/j.jenvp.2007.08.004.

Harring, N., Jagers, S.C., 2013. Should we trust in values? Explaining public support for pro-environmental taxes. Sustainability 5 (1), 210–227. https://doi.org/10.3390/su5010210.

Harring, N., Jagers, S.C., Nilsson, F., 2019. Recycling as a large-scale collective action dilemma: a cross-country study on trust and reported recycling behavior. Resour. Conserv. Recycl. 140, 85–90. https://doi.org/10.1016/j.resconrec.2018.09.008.

Hayes, A.F., 2017. Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. Guilford Publications.

Hines, J.M., Hungerford, H.R., Tomera, A.N., 1987. Analysis and synthesis of research on responsible environmental behaviour: a meta-analysis. J. Environ. Educ. 18 (2), 1–8. https://doi.org/10.1080/00958964.1987.9943482.

Hu, L.T., Bentler, P.M., 1999. Cut-off criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct. Eq. Modeling. 6, 1–55 Publisher Full Text. Educational Psychologist, 27(1), 65-90.

Hurst, M., Dittmar, H., Bond, R., Kasser, T., 2013. The relationship between materialistic values and environmental attitudes and behaviours: a meta-analysis. J. Environ. Psychol. 36, 257–269. https://doi.org/10.1016/j.jenvp.2013.09.003.

Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA), 2019. Rapporto rifiuti urbani – Edizione 2019. Roma. Available from http://www.isprambiente.gov.it/it/pubblicazioni/rapporti/rapporto-rifiuti-urbani-edizione-2019.

Jones, N., Halvadakis, C.P., Sophoulis, C.M., 2011. Social capital and household solid waste management policies: a case study in Mytilene, Greece. Environ. Pol. 20 (2), 264–283. https://doi.org/10.1080/09644016.2011.551032.

Jöreskog, K.G., Sörbom, D., 1996. PRELIS 2 User's Reference Guide: A Program for Multivariate Data Screening and Data Summarization: A Preprocessor for LISREL. Scientific Software International.

Jöreskog, K.G., Sörbom, D., Du Toit, S.H.C., 2001. LISREL 8: New Statistical Features. Scientific Software International.

Kaiser, F.G., 2006. A moral extension of the theory of planned behaviour: norms and anticipated feelings of regret in conservationism. Pers. Individ. Dif. 41 (1), 71–81. https://doi.org/10.1016/j.paid.2005.11.028.

Kerlinger, F.N., 1986. Foundations of Behavioral Research. Holt, New York, NY.

Kim, E., Ham, S., Yang, I.S., Choi, J.G., 2013. The roles of attitude, subjective norm, and perceived behavioral control in the formation of consumers' behavioral intentions to read menu labels in the restaurant industry. Int. J. Hosp. Manag. 35, 203–213. https://doi.org/10.1016/j.ijhm.2013.06.008.

Klöckner, C.A., 2013. A comprehensive model of the psychology of environmental behaviour-A meta-analysis. Global Environ. Change 23 (5), 1028–1038. https://doi.org/10.1016/j.gloenvcha.2013.05.014.

Kollmann, A., Reichl, J., 2015. How trust in governments influences the acceptance of environmental taxes. Pol. Econ. Instrum. Environ. Polit. 53–70. https://doi.org/10.7551/mitpress/9780262029247.003.0004.

Knussen, C., Yule, F., MacKenzie, J., Wells, M., 2004. An analysis of intentions to recycle household waste: the roles of past behaviour, perceived habit, and perceived lack of facilities. J. Environ. Psychol. 24 (2), 237–246. https://doi.org/10.1016/j.jenvp.2003.12.001.

Konisky, D.M., Milyo, J., Richardson, L.E., 2008. Environmental policy attitudes: issues, geographical scale, and political trust. Soc. Sci. Q. 89 (5), 1066–1085. https://doi.org/10.1111/j.1540-6237.2008.00574.x.

La Repubblica, 11 January, 2019. Bari, è qui la nuova Terra dei fuochi: con i Rangers nelle 56 discariche abusive in città. Available from. https://video.repubblica.it/edizione/bari/bari-e-qui-la-nuova-terra-dei-fuochi-con-i-rangers-nelle-56-discariche-abusive-in-citta/324267/324885.

MacKinnon, D.P., Lockwood, C.M., Hoffman, J.M., West, S.G., Sheets, V., 2002. A comparison of methods to test mediation and other intervening variable effects. Psychol. Methods 7 (1), 83. https://doi.org/10.1037/1082-989X.7.1.83.

Madden, T.J., Ellen, P.S., Ajzen, I., 1992. A comparison of the theory of planned behavior and the theory of reasoned action. Person. Soc. Psychol. Bull. 18 (1), 3–9. https://doi.org/10.1177/0146167292181001.

Maio, G.R., Olson, J.M., Bernard, M.M., Luke, M.A., 2006. Ideologies, values, attitudes, and behavior. Handbook of Social Psychology. Springer, Boston, MA, pp. 283–308. https://doi.org/10.1007/0-387-36921-X_12.

Mannetti, L., Pierro, A., Livi, S., 2004. Recycling: planned and self-expressive behaviour. J. Environ. Psychol. 24 (2), 227–236. https://doi.org/10.1016/j.jenvp.2004.01.002.

Martuzzi, M., Bianchi, F., Comba, P., Fazzo, L., Minichilli, F., Mitis, F., 2008. Trattamento dei rifiuti in Campania. Studio di correlazione tra rischio ambientale da rifiuti, mortalità e malformazioni congenite. Report ordered by the Italian Department of Civil Protection. Available online at: http://www.iss.it/binary/epam/cont/view.1190959279.htm (Last Accessed on 28 March 2010).

Matthies, E., Selge, S., Klöckner, C.A., 2012. The role of parental behaviour for the development of behaviour specific environmental norms–The example of recycling and re-use behaviour. J. Environ. Psychol. 32 (3), 277–284. https://doi.org/10.1016/j.jenvp.2012.04.003.

McCarty, J.A., Shrum, L.J., 1994. The recycling of solid wastes: personal values, value orientations, and attitudes about recycling as antecedents of recycling behavior. J. Bus. Res. 30 (1), 53–62. https://doi.org/10.1016/0148-2963(94)90068-X.

McDonald, R.P., 1978. Generalizability in factorable domains: "domain validity and generalizability": 1. Educ. Psychol. Meas. 38 (1), 75–79. https://doi.org/10.1177/001316447803800111.

McDonald, R.P., 1999. Test Theory: A Unified Treatment. Erlbaum, Hillsdale.

Miliute-Plepiene, J., Hage, O., Plepys, A., Reipas, A., 2016. What motivates households recycling behaviour in recycling schemes of different maturity? Lessons from Lithuania and Sweden. Resour. Conserv. Recycl. 113, 40–52. https://doi.org/10.1016/j.resconrec.2016.05.008.

Mintz, K.K., Henn, L., Park, J., Kurman, J., 2019. What predicts household waste management behaviors? Culture and type of behavior as moderators. Resour. Conserv. Recycl. 145, 11–18. https://doi.org/10.1016/j.resconrec.2019.01.045.

Morata-Ramirez, M.D.L.A., Holgado-Tello, F.P., 2013. Construct validity of Likert scales through confirmatory factor analysis: a simulation study comparing different methods of estimation based on Pearson and polychoric correlations. Int'l J. Soc. Sci. Stud. 1, 54. https://doi.org/10.11114/ijsss.v1i1.27.

MORI Social Research Institute for Regen South West, 2004. Attitudes Towards Renewable Energy in Devon. . http://www.regensw.co.uk/content-download/DevonMORIPollReport091104.pdf (July 8, 2006).

Musella, A., 2008. Mi rifiuto. Le lotte in difesa della salute e dell'ambiente in Campania. Sensibili alle foglie, Dogliani.

Nguyen, T.T.P., Zhu, D., Le, N.P., 2015. Factors influencing waste separation intention of residential households in a developing country: Evidence from Hanoi, Vietnam. Habitat Int. 48, 169–176. https://doi.org/10.1016/j.habitatint.2015.03.013.

Nordlund, A.M., Garvill, J., 2003. Effects of values, problem awareness, and personal norm on willingness to reduce personal car use. J. Environ. Psychol. 23 (4), 339–347. https://doi.org/10.1016/S0272-4944(03)00037-9.

Oreg, S., Katz-Gerro, T., 2006. Predicting pro-environmentalbehaviour cross-nationally: values, the theory of planned behaviour, and value-belief-norm theory. Environ. Behav. 38 (4), 462–483. https://doi.org/10.1177/0013916505286012.

Osbaldiston, R., Schott, J.P., 2012. Environmental sustainability and behavioural science: meta-analysis of pro-environmental behaviour experiments. Environ. Behav. 44 (2), 257–299. https://doi.org/10.1177/0013916511402673.

Osservatorio Ambiente e Legalità di Legambiente, 2007. Rapporto Ecomafia 2007. I numeri e le storie della criminalità ambientale. Edizioni Ambiente, Milano.

Oztekin, C., Teksöz, G., Pamuk, S., Sahin, E., Kilic, D.S., 2017. Gender perspective on the factors predicting recycling behaviour: implications from the theory of planned behaviour. Waste Manag. 62, 290–302. https://doi.org/10.1016/j.wasman.2016.12.036.

Peluso, P., 2015. Dalla terra dei fuochi alle terre avvelenate: lo smaltimento illecito dei rifiuti in Italia. Rivista di Criminologia, Vittimologia e Sicurezza 9 (2), 13–30. https://doi.org/10.14664/rcvs/252.

Peters, G.J.Y., 2014. The alpha and the omega of scale reliability and validity: why and how to abandon Cronbach's alpha and the route towards more comprehensive assessment of scale quality. Eur. Health Psychol. 16, 56–69. https://doi.org/10.31234/osf.io/h47fv.

Peters, G.J.Y., 2015. User Friendly Science: Quantitative Analysis Made Accessible. R Package Version 0.3-0.

Petts, J., 2008. Public engagement to build trust: false hopes? J. Risk Res. 11 (6), 821–835. https://doi.org/10.1080/13669870701715592.

Pivetti, M., Camodeca, M., Rapino, M., 2016. Shame, guilt, and anger: their cognitive, physiological, and behavioural correlates. Curr. Psychol. 35 (4), 690–699. https://doi.org/10.1007/s12144-015-9339-5.

Poškus, M.S., 2016. Investigating pro-environmental behaviours of Lithuanian university students. Curr. Psychol. 1–9. https://doi.org/10.1007/s12144-016-9506-3.

Preacher, K.J., Hayes, A.F., 2008. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behav. Res. Methods 40 (3), 879–891. https://doi.org/10.3758/BRM.40.3.879.

R Development Core Team, 2014. R: A Language and Environment for Statistical Computing. Vienna, Austria. Retrieved from. http://www.r-project.org/

Rabitti, P., 2008. Ecoballe. Tutte le verità su discariche, inceneritori, smaltimento abusivo dei rifiuti. Testimonianza shock su Napoli e Campania. Aliberti, Rome.

Raimondi, R., 2007. Rapporto sul disastro ambientale dei rifiuti in Campania. Il diritto al risarcimento dei danni. Assise Bull. 12, 29–33.

Sælen, H., Westskog, H., Strumse, E., 2012. Values, attitudes, and pro-environmental behaviours-is there a link? Results from a Norwegian survey. Econ. Bull. 32 (1), 486–493.

Scafuto, F., La Barbera, F., 2016. Protest against waste contamination in the' land of fires': psychological antecedents for activists and non-activists. J. Community Appl. Soc. Psychol. 26 (6), 481–495. https://doi.org/10.1002/casp.2275.

Schermelleh-Engel, K., Moosbrugger, H., Müller, H., 2003. Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures. Methods Psychol. Res. Online 8 (2), 23–74.

Schultz, P.W., Zelezny, L., 1999. Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. J. Environ. Psychol. 19 (3), 255–265. https://doi.org/10.1006/jevp.1999.0129.

Schultz, P.W., Gouveia, V.V., Cameron, L.D., Tankha, G., Schmuck, P., Franěk, M., 2005. Values and their relationship to environmental concern and conservation behaviour. J. Cross. Psychol. 36 (4), 457–475. https://doi.org/10.1177/0022022105275962.

Schultz, W.P., Khazian, A.M., Zaleski, A.C., 2008. Using normative social influence to promote conservation among hotel guests. Soc. Influen. 3 (1), 4–23. https://doi.org/10.1080/15534510701755614.

Schwartz, S.H., 1977. Normative influence on altruism. In: In: Berkowitz, L. (Ed.), Advances in Experimental Social Psychology 10. Academic Press, New York, pp. 221–279. https://doi.org/10.1016/S0065-2601(08)60358-5.

Schwepker Jr, C.H., Cornwell, T.B., 1991. An examination of ecologically concerned consumers and their intention to purchase ecologically packaged products. J. Public Policy Mark. 10 (2), 77–101. https://doi.org/10.1177/074391569101000205.

Senior, K., Mazza, A., 2004. Italian "Triangle of death" linked to waste crisis. Lancet Oncol. 5 (9), 525–527. https://doi.org/10.1016/S1470-2045(04)01561-X.

Shen, L., Si, H., Yu, L., Si, H., 2019. Factors influencing young people's intention toward municipal solid waste sorting. Int. J. Environ. Res. Public Health 16 (10), 1708. https://doi.org/10.3390/ijerph16101708.

Shrout, P.E., Bolger, N., 2002. Mediation in experimental and nonexperimental studies: new procedures and recommendations. Psychol. Methods 7 (4), 422. https://doi.org/10.1037/1082-989X.7.4.422.

Si, H., Shi, J.G., Tang, D., Wu, G., Lan, J., 2020. Understanding intention and behavior toward sustainable usage of bike sharing by extending the theory of planned behavior. Resour. Conserv. Recycl. 152, 104513. https://doi.org/10.1016/j.resconrec.2019.104513.

Sidique, S.F., Joshi, S.V., Lupi, F., 2010. Factors influencing the rate of recycling: an analysis of Minnesota counties. Resour. Conserv. Recycl. 54 (4), 242–249. https://doi.org/10.1016/j.resconrec.2009.08.006.

Smith, H.J., Tyler, T.R., 1996. Justice and power: When will justice concerns encourage the advantaged to support policies which redistribute economic resources and the disadvantaged to willingly obey the law? Eur. J. Soc. Psychol. 26 (2), 171–200.

Sperry, D.M., Widom, C.S., 2013. Child abuse and neglect, social support, and psychopathology in adulthood: a prospective investigation. Child Abuse Negl. 37 (6), 415–425. https://doi.org/10.1016/j.chiabu.2013.02.006.

Steg, L., Vlek, C., 2009. Encouraging pro-environmental behaviour: an integrative review and research agenda. J. Environ. Psychol. 29 (3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004.

Steg, L., Bolderdijk, J.W., Keizer, K., Perlaviciute, G., 2014. An integrated framework for encouraging pro-environmental behaviour: the role of values, situational factors and goals. J. Environ. Psychol. 38, 104–115. https://doi.org/10.1016/j.jenvp.2014.01.002.

Stern, P.C., 2000. New environmental theories: toward a coherent theory of environmentally significant behaviour. J. Soc. Issues 56 (3), 407–424. https://doi.org/10.1111/0022-4537.00175.

Stern, P.C., Dietz, T., Black, J.S., 1985. Support for environmental protection: the role of moral norms. Popul. Environ. 8 (3-4), 204–222. https://doi.org/10.1007/BF01263074.

Stern, P.C., Dietz, T., 1994. The value basis of environmental concern. J. Soc. Issues 50 (3), 65–84. https://doi.org/10.1111/j.1540-4560.1994.tb02420.x.

Sustainable Development Foundation Dossier, 2016. Potenzialità e ostacoli della raccolta differenziata nel mezzogiorno. Dossier 2016. Available from. http://www.corepla.it/documenti/bf794795-6c38-4c79-bc91-cd00d5985828/Dossier-Potenzialita_ostacoli_raccolta_differenziata_nel_Mezzogiorno.pdf.

Swami, V., Chamorro-Premuzic, T., Snelgar, R., Furnham, A., 2011. Personality, individual differences, and demographic antecedents of self-reported household waste management behaviours. J. Environ. Psychol. 31 (1), 21–26. https://doi.org/10.1016/j.jenvp.2010.08.001.

Thomas, C., Sharp, V., 2013. Understanding the normalisation of recycling behaviour and its implications for other pro-environmental behaviours: a review of social norms and recycling. Resour. Conserv. Recycl. 79, 11–20. https://doi.org/10.1016/j.resconrec.2013.04.010.

Tonglet, M., Phillips, P.S., Read, A.D., 2004. Using the Theory of Planned Behaviour to investigate the determinants of recycling behaviour: a case study from Brixworth, UK. Resour. Conserv. Recycl. 41 (3), 191–214. https://doi.org/10.1016/j.resconrec.2003.11.001.

Tsai, T.H., 2008. The impact of social capital on regional waste recycling. Sustain. Dev. 16 (1), 44–55. https://doi.org/10.1002/sd.326.

Van Lange, P.A., Joireman, J., Parks, C.D., Van Dijk, E., 2013. The psychology of social dilemmas: a review. Org. Behav. Hum. Decision Processes 120 (2), 125–141. https://doi.org/10.1016/j.obhdp.2012.11.003.

Varotto, A., Spagnolli, A., 2017. Psychological strategies to promote household recycling. A systematic review with meta-analysis of validated field interventions. J. Environ. Psychol. 51, 168–188. https://doi.org/10.1016/j.jenvp.2017.03.011.

Verma, N., Kaur, M., Tripathi, A.K., 2020. Greenhouse gas emissions from municipal solid waste management practice. Environmental Concerns and Sustainable Development. Springer, Singapore, pp. 399–408.

Visschers, V.H., Wickli, N., Siegrist, M., 2016. Sorting out food waste behaviour: a survey on the motivators and barriers of self-reported amounts of food waste in households. J. Environ. Psychol. 45, 66–78. https://doi.org/10.1016/j.jenvp.2015.11.007.

Wan, C., Cheung, R., Qiping Shen, G., 2012. Recycling attitude and behaviour in university campus: a case study in Hong Kong. Facilities 30 (13/14), 630–646. https://doi.org/10.1108/02632771211270595.

Wan, C., Shen, G.Q., Choi, S., 2017. A review on political factors influencing public support for urban environmental policy. Environ. Sci. Policy 75, 70–80. https://doi.org/10.1016/j.envsci.2017.05.005.

Wang, B., Ren, C., Dong, X., Zhang, B., Wang, Z., 2019. Determinants shaping willingness towards on-line recycling behaviour: an empirical study of household e-waste ecycling in China. Resour. Conserv. Recycl. 143, 218–225. https://doi.org/10.1016/j.resconrec.2019.01.005.

Warren, M.E., (1999). 11 Democratic theory and trust. Democracy and trust, 310. https://doi.org/10.1017/CBO9780511659959.

Wynne, B., 1995. Public understanding of science. Handbook of Science and Technology Studies. pp. 361–388. https://doi.org/10.4135/9781412990127.n17.

Weiner, B., 2000. Intrapersonal and interpersonal theories of motivation from an attributional perspective. Educ. Psychol. Rev. 12 (1), 1–14. https://doi.org/10.1023/A:1009017532121.

Xiao, C., McCright, A.M., 2015. Gender differences in environmental concern: Revisiting the institutional trust hypothesis in the USA. Environ. Behav. 47 (1), 17–37. https://doi.org/10.1177/0013916513491571.

Zannakis, M., Wallin, A., Johansson, L.-O., 2015. Political Trust and Perceptions of the Quality of Institutional Arrangements – how do they influence the public's acceptance of environmental rules. Environ. Policy Gov. 25 (6), 424–438. https://doi.org/10.1002/eet.1676.

Zhang, D., Huang, G., Yin, X., Gong, Q., 2015. Residents' waste separation behaviours at the source: using SEM with the theory of planned behaviour in Guangzhou, China. Int. J. Environ. Res. Public Health 12 (8), 9475–9491. https://doi.org/10.3390/ijerph120809475.

Zhao, X., Lynch Jr, J.G., Chen, Q., 2010. Reconsidering Baron and Kenny: Myths and truths about mediation analysis. J. Consumer Res. 37 (2), 197–206. https://doi.org/10.1086/651257.