The Behaviour of the Third Age towards the Recycling of printed paper in the Region of Attica. Case Study: The Municipalities of Egaleo and Chaidari

Xenophontas Passas
MSc in Sustainable Development,
PhD Student Harokopio University,
El. Venizelou 70, 17671, Athens, Greece

Roido Mitoula
Professor, Harokopio University,
El. Venizelou 70, 17671, Athens, Greece

Eleni Sardianou
Associate Professor, Harokopio University
El. Venizelou 70, 17671, Athens, Greece

Eleni Theodoropoulou
Professor, Harokopio University
El. Venizelou 70, 17671, Athens, Greece

ABSTRACT

The purpose of this thesis is to examine the determinant factors of recycling and in particular of paper recycling. The research focuses on paper recycling behaviour on the part of the elderly in the Region of Attica. Primary research was based on the use of layered data. The survey data were collected through the distribution of questionnaires to senior citizens in the municipalities of Egaleo and Chaidari. The questionnaire was given hand by hand in the region's Open Care Center for the Elderly (OCCE) during the period from November 2017 until February 2018 (11/2017 - 02/2018). The final sample of the survey amounted to 375 participants. Through multiple linear regressions, behaviour towards paper recycling seems to be affected by the intention to recycle, subjective patterns, perceived behavioural control, moral standards, educational level, monthly family income and monthly pension. Similarly, an increased intention to recycle paper is associated with higher values of the scale of recycling behaviour. Regarding the socio-demographic data of the participants, the participants who are graduates of post-secondary education show a lower score on the recycling behavior scale than the graduates of Primary school. Participants with a monthly family income of between € 800 and € 1500 have a lower score on the recycling behaviour scale than those with a monthly family income of less than € 800.

Keywords: Recycling Behaviour, Paper, Elderly, Predicted Behaviour Model, Recycling Behavioural Determinant factors, Linear Regression.

INTRODUCTION

The present dissertation aims to study the disposal management in the Urban Region of Attica. In particular, the dissertation focuses on the green management of printed paper. Paper production has a significant impact on the environment. Its use and process as a raw material has a variety of adverse effects on the environment. On the other hand, there are new technologies / methods that can mitigate the negative effects of paper production on the environment, while having positive economic results (Laurijssen et al., 2010).

One of these methods is recycling, which does not only involve the benefit of re-use of waste. The main benefit of recycling is the lower environmental burden with pollutants / wastes, which mitigates the negative environmental impact of paper production (Pati et al., 2008). These two categories of recycling benefits are related to the production process and, in particular, inputs / production factors and outputs / products. Recycling contributes to the conservation of natural resources by reintroducing inputs (in this case paper) back into the production process. Re-usage of waste is the reason why recycling has positive financial results (Virtanen et al., 2013).). On the other hand, recycling reduces the harmful effects resulting in the increase of the volume of waste. Therefore, in terms of output, the production process creates fewer externalities for society as a whole, given that paper production of recycled paper fibres consumes less energy, preserves natural resources (wood) and reduces environmental pollution. The conflict between financial optimization and environmental protection has drawn the attention of research programs concerning the design of disposal management systems (Pati et al., 2006).

Recycling is not a new technology. It is essentially a commercial proposal, since Matthias Koops founded the Neckinger mill in 1826, which produced white paper from printed paper waste. However, there have been very few researches on the impact of recycling until the end of the 1960s. From the late 1960s to the late 1970s, significant researches were carried out to determine the impact of recycling on the properties of pulp (Nazhad & Paszner, 1994).

In the late 1980s and early 1990s, recycling issues have become stronger than before because of the higher cost of landfills in developed countries and the evolution of human consciousness. The findings of the early 1970s on the effects of recycling have been confirmed, although attempts to identify the cause of these effects have not yet been fruitful (Gulsoy et al., 2013).

The limited swelling of recycled fibres has been attributed to keratinisation, which is the main cause of poor quality recycled paper (Gulsoy et al., 2013). Since 1950, fibre flexibility has been recognized as the main source of paper durability. Therefore, it is not surprising that, for over half a century, papermakers considered keratinisation to be the main source of loss due to drying, although it has never been fully understood (Sutjipto et al., 2008).

Consumption of recycled paper has been steadily growing over the past decades. According to the Confederation of European Paper Industries (CEPI), the use of recycled paper was made using virgin fibres until 2005. This development has been reinforced by the technological progress and the competitiveness of recycled fibre prices, but also by the environmental awareness at both producer and consumer level, which has affected the demand for recycled paper. The European paper industry has suffered considerable consequences as a result of the debt crisis that occurred in 2009. Several businesses ended their operation as a result of the weakening of the global economy. Despite the fact that the consumption of recycled paper in Europe has decreased during this period, exports of recycled paper to Asian markets is constantly rising. However, the recycling rate, expressed as "paper recycling volume / paper consumption volume", reached 72.2% of recycling in 2009, compared to 66.7% in 2008 (CEPI, 2015).

Despite the fact that young people in particular seem to "embrace" the need for sustainable development, and in particular the recycling initiative in Greece, a great volume of solid waste is produced. Organic / biodegradable waste consist the greatest percentage of these. About 50% of all solid waste is produced in Athens and Thessaloniki. Greece produces five million tonnes of solid waste originating from both households and businesses. This is equivalent to an

average of 450 grams per person in Greece. Regarding the recycling level in Greece, it appears to be close to the EU average, but it relies heavily on discharging into special landfills. In Greece, there are currently 7 Collective Recycling Schemes (EOAN, 2014).

Therefore it is important, through this thesis to identify the factors that seem to determine the attitudes and perceptions of the elderly, especially since it has not been studied as a separate category. Given the difficult situation that some are experiencing, it is important to look at the specific barriers they face, but also how their paper recycling action is being formed in order to develop proposals for practical implementation.

RECYCLING IN THE THIRD AGE

The dissertation aims to discuss and examine the eco-management of printed paper in the elderly. Since the research aims at examining the elderly in particular, it is interesting to study the factors that determine the behaviour towards recycling as well as the interventions carried out at household level in order to enhance environmentally friendly behaviour in general and for recycling specifically. By examining the factors influencing household recycling, conclusions can be drawn regarding the behaviour that older people are expected to have in particular.

With regard to the meta-needs, when people have met their basic needs and have reached a state of self-realization, they will seek satisfaction in relation to other needs, namely meta-needs such as knowledge, creativity, perfection, and peace. If a consumer has environmental consciousness, then he will seek to implement strategies to achieve an environmentally friendly situation, making them susceptible to such behaviours (Carmi et al., 2015).

Despite the above-mentioned theory, environmentally friendly behaviours needs are not necessarily to be always preferred by consumers because of contradictions or inhibitors (Bamberg, 2013). Carmi (2012) suggests that moral reasoning takes place when environmental impacts are recognized as significant and when there is no other possibility that affects a decision. Martinho et al. (2015) suggests that when two behaviours have the same value for the consumer, the characteristic of sustainability can determine the choice of behaviour.

Researches on environmental behaviour, part of which is recycling as well, have reported a significant relationship between consumers attitude and consumers environmental behaviour (Sidique et al., 2010). Research on environmental behaviour in general is based on two main theoretical models: the theory of reasoned action (Ajzen & Fishbein, 1980) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991). These models have shown the relationship between attitudes and behaviours; however this relationship is in some cases not as strong as expected for all environmental behaviours (Chen & Tung, 2010). Despite the fact that these models have expanded and their predictability has increased, they are not yet fully successful (Pakpour et al., 2014). The TPB assumes that consumers have a reasonable basis for their behaviour, taking into account the effects of their intentions and actions, which are influenced by the following factors (Bortoleto et al., 2012): (i) Attitude the favourable (or unfavourable) assessment behaviour of the individual, (ii) subjective rule, the perception of the individual of the social pressure to participate (or not to participate) in a particular behaviour, and (iii) perceived control, consisting of a person's perception of compliance with a behaviour.

On this basis, the aim of the research is to focus on a single aspect of environmental behaviour, recycling. Research focuses on paper recycling in households, targeting a specific age group, the third age (60+). In the next section, we examine the factors that determine behaviour towards household recycling by exploring possible researches that has provided information and data on paper recycling in particular as well as findings about the elderly in particular.

STATISTICAL SURVEY METHODOLOGY

In order to fulfil the purpose of the survey, quantitative research was selected, through the distribution of questionnaires to senior citizens in the Region of Attica. The sample of the survey consists of 375 elderly people from the region's Open Care Centre for the Elderly (OCCE) of the municipalities of Egaleo and Chaidari. The questionnaire includes factors identified in the pre-planned behaviour model (attitudes, subjective patterns, perceived behavioural control, intention and behaviour towards paper recycling), but also additional factors that have been included in the model in recent surveys (moral standards, situational factors and perceived consequences).

The variables of the study and the subsequent research models analysed comply with the existing studies, the references regarding the estimation / prediction of behaviour towards recycling. More specifically, many studies assess the impact of specific factors on the variable of behaviour towards recycling. (Chen & Tung, 2010; Best & Kneip, 2011; Bezzina & Dimech, 2011; Fornara et al., 2011; Pakpour et al., 2014; Wan et al., 2014a; Wan et al., 2014b; Babaei et al., 2015; Botetzagias et al., 2015; Martinho et al., 2015; Ari & Yilmaz, 2016; Echegaray & Hansstein, 2017).

Approach - Research variables

Independent model variables are social-demographic elements, attitudes, subjective patterns, perceived behavioural control, moral standards, conditional factors, and the perceived consequences of paper recycling. Attitudes, subjective patterns, perceived behavioural control, moral standards, state factors and the perceived consequences of paper recycling are measured as the average of the answers to the relevant questions in the second section of the questionnaire.

As already mentioned above, the selection of socio-demographic data as interpretive variables of both behaviour and intention to recycle are based on previous researches, which conclude that social-demographic data are statistically significant interpretative factors(Seacat & Northup, 2010; Saphores et al., 2012; Fiorillo, 2013; Pakpour et al., 2014; Babaei et al., 2015; Crociata et al., 2015; Martinho et al., 2015; Triguero et al., 2016; Czajkowski et al., 2017; Echegaray & Hansstein, 2017; Lizin et al., 2017; Oztekin et al., 2017; Sidique et al., 2010; Saphores et al., 2012; Yau, 2012; Miafodzyeva & Brandt, 2013; Pakpour et al., 2014; Akil et al., 2015; Alpizar & Gsottbauer, 2015; Babaei et al., 2015; Martinho et al., 2015; Arbués & Villanúa, 2016; Choon et al., 2016; Noor, 2016; Zen et al., 2014; Babaei et al., 2015; Jafari et al., 2015; Martinho et al., 2015; Choon et al., 2016; Wang et al., 2016; Fielding et al., 2016).

Accordingly, the selection of attitudes as an interpretive variable is based on a previous references that finds that it has a statistically significant effect on behavior and intent to recycle (Chen & Tung, 2010; Sidique et al., 2010; Best & Kneip, 2011; Bezzina & Dimech, 2011; Pakpour et al., 2014; Park & Ha, 2014; Wan et al., 2014a; Wan et al., 2014b; Babaei et al., 2015; Botetzagias et al., 2015; Ylä-Mella et al., 2015; Martinho et al., 2015; Arbués & Villanúa, 2016; Arı & Yılmaz, 2016; Wang et al., 2016; Echegaray & Hansstein, 2017; Oztekin et al., 2017; Wan et al., 2017). Similarly, subjective models are a statistically significant factor in predicting behavior and the intention to recycle from a part of researches (Chen & Tung, 2010; Bezzina & Dimech, 2011; Fornara et al., 2011; Park & Ha, 2014; Wan et al., 2014a; Wan et al., 2014b; Ylä-Mella et al., 2015; Arı & Yılmaz, 2016; Wang et al., 2016; Echegaray & Hansstein, 2017; Oztekin et al., 2017; Wan et al., 2017), as well as the perceived behavioral control (Chen & Tung, 2010; Fornara et al., 2011; Pakpour et al., 2014; Park & Ha, 2014; Wan et al., 2014a; Wan et al., 2014b; Ylä-Mella et al., 2015; Wan et al., 2017). From these surveys, some examine the above

factors as interpretive of the intention to recycle (Chen & Tung, 2010; Pakpour et al., 2014; Park & Ha, 2014; Ylä-Mella et al., 2015; Bezzina & Dimech, 2011; Fornara et al., 2011; Arı & Yılmaz, 2016; Wan et al., 2014a; Wan et al., 2014b; Oztekin et al., 2017; Wan et al., 2017) while others of both intention and behavior towards recycling(Chen & Tung, 2010; Pakpour et al., 2014; Ylä-Mella et al., 2015; Bezzina & Dimech, 2011; Fornara et al., 2011; Arı & Yılmaz, 2016; Wan et al., 2014a; Wan et al., 2014b; Oztekin et al., 2017; Wan et al., 2017).

Moral standards have been found in a series of researches as important interpretive factors of intention and behavior towards recycling(Chen & Tung, 2010; Saphores et al., 2012; Miafodzyeva & Brandt, 2013; Culiberg, 2014; Pakpour et al., 2014; Park & Ha, 2014; Wan et al., 2014b; Botetzagias et al., 2015; Lizin et al., 2015; Gould et al., 2016; Miliute-Plepiene et al., 2016; Czajkowski et al., 2017; Wan et al., 2017). Situational factors have been used in recent studies that have been presented as potential interpreters of behavior and intention to recycle and have a statistically significant effect as well(Chen & Tung, 2010; Seacat & Northup, 2010; Sidique et al., 2010; Best & Kneip, 2011; Bezzina & Dimech, 2011; Tabernero & Hernandez, 2011; Ittiravongs, 2012; Saphores et al., 2012; Yau, 2012; Fiorillo, 2013; Guerrero et al., 2013; Latif et al., 2013; Miafodzyeva & Brandt, 2013; Thomas & Sharp, 2013; Chi et al., 2014; Zen et al., 2014; Babaei et al., 2015; Sun et al., 2015; Ylä-Mella et al., 2015; Lakhan, 2016; Noor, 2016; Welfens et al., 2016; Wan et al., 2017). Finally, the visible consequences of recycling, which essentially measure the inherent motivation of individuals for recycling based on the results they consider to be also in previous surveys statistically significant factors explaining the behavior and intention to recycle(Bezzina & Dimech, 2011; Park & Ha, 2014; Wan et al., 2014a; Wan et al., 2014b; Wan et al., 2017).

Multiple Linear Regressions for factors of the pre-planned behavior model and demographic characteristics affecting paper recycling

Several studies have used behavior towards recycling as a dependent variable of research, both as a measure of approximation based on specific questions describing behavior towards recycling (Bezzina & Dimech, 2011; Fielding et al., 2016; Lizin et al., 2017; Miafodzyeva & Brandt, 2013; Pakpour et al., 2014; Park, 2018; Seacat & Northup, 2010; Ari & Yilmaz, 2016; Best & Kneip, 2011; Wan et al., 2014a, 2014b), and through dichotomous variables that indicate whether the participant is recycling or not (Akil et al., 2015; Babaei et al., 2015; Choon et al., 2016; Crociata et al., 2015; Czajkowski et al., 2017; Echegaray & Hansstein, 2017; Fiorillo, 2013; Jafari et al., 2015; Martinho et al., 2015; Noor, 2016; Seacat & Boileau, 2018).

In the present study, questions 43-46 are an approximate measure of behavior towards recycling as they concern the frequency of paper recycling, both in general and within one week, as well as the type of recycled paper. The regressions that have been made regarding the behavior towards recycling in this study place as the dependent variable both the average of questions 43-46 and each question of them separately as well.

In order to study the influence of the factors of the pre-designed behavior model on the recycle behavior, the following multi-line least squares regression equation was created:

Recycling Behavior *= α + β1 · Recycling intention + β2 · Recycling attitudes + β3 · Subjective Standards + β4 · Perceivable Behavioral Control + ε*

The intention to recycle is included in question 47, while attitudes towards recycling are the average of questions 10-15 in the second section of the questionnaire, the subjective standards the average of questions 16-18 and perceivable behavioral control the average in Questions

19-25. This model as presented has been used in previous studies, by Ylä-Mella et al. (2015), Ari and Yilmaz (2016) and Echegaray & Hansstein (2017).

Subsequently, previous studies have enriched the pre-planned behavior model for recycling, using as additional interpretive variables moral standards, situational factors and the visible consequences of recycling. The addition of extra variables to the basic model of predictive behavior results from the studies of Botetagias et al. (2015) [further addition of moral standards to the perceivable behavioral model factors], of Chen and Tung (2010) [further addition of moral standards, visible recycling effects and situational factors], of Wan et al. (2017) [further addition of moral standards and visible consequences], of Tong et al. (2018) and Khalil et al. (2017) [further addition of situational factors]. This model is as follows:

Recycling Behavior = *a + β1 · Recycling Intention + β2 · Recycling Attitudes + β3 · Subjective Standards + β4 · Perceivable Behavioral Control + β5 · Moral Standards + β6 · Situational Factors + b7 · Visible Recycling Effects + ε*

Moral standards are the average of questions 26-31, while situational factors the average of questions 32-35 and the visible effects the average of questions 36-42. By performing staggering regressions and gradually adding interpretive variables, the goal is to find out which is the best-explanatory regression.

Finally, several studies have used the socio-demographic data of the participants as potential interpretive factors of behavior towards recycling. Therefore, the last model that falls into those models that have as a dependent variable the approximate measure of behavior towards recycling is:

Recycling Behavior = *a + β1 · Recycling Intention + β2 · Recycling Attitudes + β3 · Subjective Standards + β4 · Perceivable Behavioral Control + β5 · Moral Standards + β6 · Situational Factors + β7 · Visible Recycling Effects + β8 · Gender+ β9 · Age + b10 · Educational level + β11 · Monthly family income + β12 · Monthly pension + β13 · Personal status + β14 · Number of children + β15 · Residence + β16 · Residential Status + e*

The additional interpretive variables added to this model are included in section A of the questionnaire (questions 1-9). The addition of demographic variables as interpretative as behavioral determinants towards recycling stems from Bezzina and Dimech (2011), Babaei et al. (2015), Arbués and Villanúa (2016) and Tong et al. (2018).

Thus, the multiple linear regression model is:

Recycling behavior= $a + b_1 \cdot DRI_1 + b_2 \cdot DRI_2 + b_3 \cdot DRI_3 + b_4 \cdot DRI_{4+} b_5 \cdot RS + b_6 \cdot SM + b_7 \cdot CBC + b_8 \cdot EM + b_9 \cdot SF + b_{10} \cdot CC + b_{11} \cdot SEX + b_{12} \cdot AGE + b_{13} \cdot DEDU_1 + b_{14} \cdot DEDU_2 + b_{15} \cdot DEDU_3 + b_{16} \cdot DEDU_4 + b_{15} \cdot DEDU_5 + b_{16} \cdot DEDU_6 + b_{17} \cdot DINC_1 + b_{18} \cdot DINC_2 + b_{19} \cdot DINC_3 + b_{20} \cdot DINC_4 + b_{21} \cdot PEN + b_{22} \cdot DPER_1 + b_{23} \cdot DPER_2 + b_{24} \cdot DPER_{23} + b_{25} \cdot CHD + b_{26} \cdot DLIV_1 + b_{27} \cdot DLIV_2 + b_{28} \cdot DLIV_3 + b_{29} \cdot DLIV_4 + b_{30} \cdot DHST_1 + b_{31} \cdot DHST_2 + \varepsilon$

- Recycling behavior: it is the dependent quantitative variable for the Recycling Behavior scale (average of answers to questions 43-45 and 46). It takes values between 1 and 5.
- DR_1: it is a pseudo variable used to encode the variable of Recycling Intention (question 47). It takes the value 1 if it is very unlikely for the citizen to recycle paper within the next month and 0 if differently.

- DR_2: it is a pseudo variable used to encode the variable of Recycling Intention (question 47). It takes the value 1 if it is neither possible nor impossible for the citizen to recycle paper within the next month and 0 if differently.
- DR_3: it is a pseudo variable used to encode the variable of Recycling Intention (question 47). It takes the value 1 if it is possible for the citizen to recycle paper within the next month and 0 if differently.
- DR_4: it is a pseudo variable used to encode the variable of Recycling Intention (question 47). It takes the value 1 if it is very likely for the citizen to recycle paper within the next month and 0 if different.
- RS: it is an independent quantitative variable that is the average of the answers to questions 10-15 (scale Attitudes towards recycling). It takes values between 1 and 5.
- SM: it is an independent quantitative variable which is the average of answers to questions 16-18 (Subjective Standards scale). It takes values between 1 and 5.
- CBC: it is an independent quantitative variable that is the average of answers to questions 19-25 (Perceivable Behavioral Control Scale). It takes values between 1 and 5.
- EM: it is an independent quantitative variable that is the average of the answers to questions 26-31 (Moral Standards scale). It takes values between 1 and 5.
- SF: it is an independent quantitative variable that is the average of the answers to questions 32-35 (Situational factors scale). It takes values between 1 and 5.
- CC: it is an independent quantitative variable which is the average of the answers to questions 36-42 (Scale Perceptible Recycling Effects). It takes values between 1 and 5.
- Gender: it is an independent qualitative variable expressing the gender of the citizen. It takes the value 0 if the citizen is a woman and 1 if the citizen is a man.
- AGE: it is an independent quantitative variable that expresses the age of the citizens.
- $DEDU_1$: it is a pseudo variable used to encode the Educational Level variable. It takes 1 if the citizen is a high school graduate and 0 if different.
- $DEDU_2$: it is a pseudo variable used to encode the Educational Level variable. It takes 1 if the citizen is a senior high school graduate and 0 if different.
- $DEDU_3$: it is a pseudo variable used to encode the Variable Educational Level. It takes the value 1 if the citizen is a post secondary high school graduate and 0 if different.
- $DEDU_4$: it is a pseudo variable used to encode the Educational Level variable. It takes the value 1 if the citizen is a college graduate and 0 if different.
- $DEDU_5$: it is a pseudo variable used to encode the Educational Level variable. It takes the value 1 if the citizen holds a master degree and 0 if different.
- $DEDU_6$: it is a pseudo variable used to encode the Educational Level variable. It takes the value 1 if the citizen holds a doctorate and 0 if different.
- $DINC_1$: it is a pseudo variable used to encode the Monthly Family Income variable. It takes the value 1 if the citizen has a monthly family income of between € 801 and € 1500 and 0 if different.
- $DINC_2$: it is a pseudo variable used to encode the Monthly Family Income variable. It takes the value 1 if the citizen has a monthly family income between 1501 € and 2500 € and 0 if different.
- $DINC_3$: it is a pseudo variable used to encode the Monthly Family Income variable. It takes the value 1 if the citizen has a monthly family income between 2501 € and 3500 € and 0 if different.
- $DINC_4$: it is a pseudo variable used to encode the Monthly Family Income variable. It takes the value 1 if the citizen has a monthly family income of more than 3500 € and 0 if different.
- PEN: it is an independent quantitative variable expressing the monthly pension of the citizens.

- $DPER_1$: it is a pseudo variable used to encode the variable Marital Status. It takes the value 1 if the citizen is married and 0 different.
- $DPER_2$: it is a pseudo variable used to encode the variable Marital Status. It takes the value 1 if the citizen is divorced and 0 if different.
- $DPER_3$: it is a pseudo variable used to encode the variable Marital Status. It takes the value 1 if the citizen is widowed and 0 if different.
- CHD: it is an independent quantitative variable that expresses the number of children that the citizens have.
- $DLIV_1$: it is a pseudo variable used to encode the variable Residence. It takes the value 1 if the citizen lives with the spouse / partner and 0 if different.
- $DLIV_2$: it is a pseudo variable used to encode the variable Residence. It takes the value 1 if the citizen lives with the spouse / partner and the children and 0 if different.
- $DLIV_3$: it is a pseudo variable used to encode the variable Residence. It takes the value 1 if the residence lives with the children and 0 if different.
- $DLIV_4$: it is a pseudo variable used to encode the variable Residence. It takes the value 1 if the citizen lives with siblings or other relatives, housekeeper, institution for the elderly etc. and 0 if different.
- $DHST_1$: it is a pseudo variable used to encode the variable Residential status. It takes the value 1 if the citizen owns their house and 0 if different.
- $DHST_2$: it is a pseudo variable used to encode the Residential status variable. It takes the value 1 if the citizen is hosted and 0 if different.

Table 1 shows the multiple linear regression effects for the multiple regression models.

Table 1: Linear Regression Findings

Variables		Initial model		Final Model	
		B	p	B	p
Constant	α	0,208	0,663	0,244	0,200
Recycling Intention	DRI$_1$	0,282	**0,048**	0,261	0,054
	DRI$_2$	0,652	**< 0,001**	0,611	**< 0,001**
	DRI$_3$	0,972	**< 0,001**	0,951	**< 0,001**
	DRI$_4$	1,738	**< 0,001**	1,733	**< 0,001**
Attitudes towards recycling	RS	-0,017	0,807	–	–
Subjective standards	SM	0,114	**0,012**	0,122	**0,002**
Perceivable Behavioral Control	CBC	0,127	**0,025**	0,105	**0,027**
Moral Standards	EM	0,112	0,064	–	–
Situational factors	SF	0,010	0,815	–	–
Visible effects of recycling	CC	-0,075	0,301	–	–
Gender	SEX	-0,064	0,278	–	–
Age	AGE	-0,001	0,779	–	–
Educational level	DEDU$_1$	0,015	0,883	0,001	0,990
	DEDU$_2$	0,091	0,222	0,075	0,292
	DEDU$_3$	-0,377	**0,035**	-0,408	**0,018**
	DEDU$_4$	-0,005	0,954	-0,011	0,891
	DEDU$_5$	-0,069	0,832	-0,185	0,564
	DEDU$_6$	0,125	0,709	0,090	0,783
Monthly family income	DINC$_1$	-0,220	**0,007**	-0,208	**0,009**
	DINC$_2$	-0,147	0,192	-0,150	0,162
	DINC$_3$	-0,235	0,198	-0,201	0,230
	DINC$_4$	-0,488	0,082	-0,471	0,084
Monthly pension	PEN	0,000	**0,024**	< 0,001	**0,021**
Personal status	DPER$_1$	0,065	0,639	–	–
	DPER$_2$	0,064	0,601	–	–
	DPER$_3$	-0,031	0,816	–	–
Number of children	CHD	-0,016	0,544	–	–
Living with	DLIV$_1$	0,007	0,963	–	–
	DLIV$_2$	-0,095	0,506	–	–
	DLIV$_3$	0,034	0,739	–	–
	DLIV$_4$	-0,142	0,146	–	–
Residential status	DHST$_1$	0,060	0,381	–	–
	DHST$_2$	0,176	0,120	–	–
F		18,547	**< 0,001**	10,474	**< 0,001**
R^2		0,642		0,628	
R^2 (adjusted)		0,608		0,610	

The involvement of Variable Attitudes towards Recycling, Moral Standards, Situational Factors, Visible Recycling Effects, Gender, Age, Personal Status, Number of Children, Residence and Residential Status was not valued statistically significant in the regression model. The final regression model explains about 61.0% of the variability in the recycling behavior. In particular, citizens who claim that it is neither likely nor impossible to recycle paper within the next month show a higher score of 0.611 units on the recycling behavior scale than those who claim that it is very unlikely to recycle paper within the next month (p <0.001), keeping all other model variables constant.

Scores in the scale of Recycling behavior are even higher for the citizens who claim that it is likely to recycle paper within the next month compared to those who claim it is very unlikely, as the values are increased by 0.951 units (p <0.001) keeping all other variables constant.

Citizens who claim that it is very likely that they recycle paper within the next month appear to show a much higher value on the recycling behavior scale, increased by 1,739 units, compared to those who say that it is unlikely to recycle paper within the next month (p <0.001), keeping all other model variables constant.

In addition, keeping the remaining variables constant, an increase in the scale of subjective standards by 1 unit, results in an increase in the recycling behavior scale by 0.122 units (p = 0.002), while an increase of 1 unit in the perceivable behavioral control scale leads to an increase in the recycling behavior scale by 0.105 units (p = 0.027).

Citizens who are graduates of post-secondary education show a lower score of 0.408 points on the recycling behavior scale compared to Primary education graduates (p = 0.018), keeping all other variables constant.

In addition, citizens with a monthly family income of between € 800 and € 1500 show a 0.208 lower value than the citizens with a monthly family income of less than € 800 (p = 0.009), keeping all other variables constant.

A rise in the monthly pension for citizens by € 1 brings a small increase (of 0.000259 units) in the recycling behavior scale (p = 0.021), keeping all other model variables constant.

BASIC LINEAR REGRESSION FINDINGS

Continuing with the regressions made with regard to whether the participants are recycling or not, an important predictive factor is the intention to recycle. The regressions setting as a dependent variable, the approximate measure of behavior towards recycling, shows that intention seems to affect significantly and statistically once more the behavior towards recycling, which goes hand in hand with past studies (Ari & Yilmaz, 2016; Best & Kneip, 2011; Bezzina & Dimech, 2011; Chen & Tung, 2010; Echegaray & Hansstein, 2017; Fornara et al., 2011; Martinho et al., 2015; Pakpour et al., 2014; Wan et al., 2014a; Wan et al., 2014b; Ylä-Mella et al., 2015; Oztekin et al., 2017; Tong et al., 2018). Indeed, as the probability of recycling paper within the next month increases, the more likely it is to observe positive behavior towards recycling. In this model, subjective patterns positively influence behavior towards recycling alongside with the perceivable behavioral control. Subjective standards have a statistically significant impact on previous presented studies (Ari & Yilmaz, 2016; Bezzina & Dimech, 2011; Chen & Tung, 2010; Fornara et al., 2011; Wan et al., 2014b; Ylä-Mella et al., 2015; Oztekin et al., 2017), ενώ και ο αντιληπτός συμπεριφορικός έλεγχος (Wan et al., 2014b; Ylä-Mella et al., 2015; Oztekin et al., 2017; Tong et al., 2018; Passafaro & Livi, 2017) has been found to be a statistically significant factor of influence towards recycling behavior. Once more, attitudes in this model also do not have a statistically significant effect as well, which is in contrast to previous research that concludes that attitude is the most important predictor of behavior towards recycling(Ari & Yilmaz, 2016; Best & Kneip, 2011; Bezzina & Dimech, 2011; Chen & Tung, 2010; Pakpour et al., 2014; Wan et al., 2014b). Adding to the model the extra variables of moral standards, perceptual consequences and situational factors, it is observed that the adjusted determinant has a marginal increase. This marginal increase is due to the fact that moral standards have a statistically significant impact on this model, which is positive. Moral standards have been found to have a statistically significant impact on the recycling behavior in Miafodzyeva and Brandt (2013) meta-analysis, but also in studies concerning the United States (Gould et al., 2016; Huber et al. 2017), but also in Europe (Lizin et al., 2017; Passafaro & Livi, 2017) and Asia (Wan et al., 2017; Nguyen et al., 2017).

By adding demographic data to the model, the adjusted determinant factor also shows a marginal increase, which is due to the statistically significant effect of the educational level, monthly family income and monthly pension. Citizens who are graduates of post-secondary education show a lower value of 0.408 points in the recycling behavior scale in comparison with Primary School graduates. Citizens with a monthly family income of between € 800 and € 1500 show a lower value of 0.208 units on the recycling behavior scale compared to citizens with a monthly family income of less than € 800. Rising the monthly pension for citizens by € 1 results in a slight increase (of the order of 0.000259 units) in the recycling behavior scale. The results are consistent with previous studies that find that the educational level (Lizin et al., 2017; Seacat & Northup, 2010) and income (Miafodzyeva & Brandt, 2013; Yau, 2012) play an important role in predicting behavior towards recycling.

Consequently, the paper recycling behavior of elderly people in the sample, which is detected by the paper recycling frequency in general and on a weekly basis both at the individual and household levels, but also based on the types of paper recycled, is determined both by the intention to recycle paper, and subjective standards, as well as by perceived behavioral control and moral standards as well. It is also influenced by the educational level and economic factors such as monthly family income and monthly pension, although its effect is rather small. The latter, in practice, means that what plays a more important role is the income of the household in general and not the individual's monthly income exclusively.

CONCLUSIONS

Through correlations, it has also emerged that attitudes, subjective standards, perceivable behavioral control, moral standards, situational factors, perceivable consequences and intention to recycle affect behavior towards recycling. All factors reinforce behavior towards paper recycling, apart from the situational factors. Specifically, the higher the perceivable hindrance, the less the behavior towards paper recycling is enhanced.

More specifically, through multiple linear regressions, behavior towards paper recycling appears to be influenced by the intention to recycle, subjective models, perceivable behavioral control, moral standards, educational level, monthly family income and monthly pension. Similarly, an increased intention to recycle paper is associated with higher values in the scale of behavior towards recycling (participants actually recycle more). In this model, subjective and moral standards positively influence behavior towards recycling alongside with perceivable behavioral control. As far as the socio-demographic data of the participants is concerned, the participants who are graduates of post-secondary education show a lower value on the recycling behavior scale compared to the graduates of Primary school education. Participants with a monthly family income of between € 800 and € 1500 have a lower value on the recycling behavior scale than those with a monthly family income of less than € 800. A rise to the monthly pension for citizens by € 1 brings a marginal increase in the recycling behavior scale.

This dissertation contributes to the knowledge it provides regarding the behavior towards a particular category of material, the paper and a specific age group of the population, the elderly. Although there are few recent studies including paper recycling behavior as a dependent variable that has been studied, there is no research focusing specifically on the elderly. Consequently, this dissertation contributes to the existing literature regarding the behavior towards recycling and provides the basis for further practical implementation proposals so as to enhance paper recycling from the part of the elderly, given the constraints they may face.

References

Ajzen, I. (1991). The Theory of Planned Action. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. [Online]. Retrieved January 3, 2017, by:http://www.sciencedirect.com/science/article/pii/074959789190020T

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Akil, A., Foziah, J., & Ho, C.S. (2015). The Effects of Socio-Economic Influences on Households Recycling Behaviour in Iskandar Malaysia. *Procedia - Social and Behavioral Sciences, 202*, 124-134. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S1877042815048636

Alpízar, F., & Gsottbauer, E. (2015). Reputation and household recycling practices: Field experiments in Costa Rica. *Ecological Economics, 120*, 366–375. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S0921800915001597

Arbués, F., & Villanúa, I. (2016). Determinants of behavior toward selective collection of batteries in Spain. A bivariate probit model. *Resources, Conservation and Recycling, 106,* 1–8. [Online]. Retrieved March 15, 2017, by: http://www.sciencedirect.com/science/article/pii/S0921344915301294

Arı, E., & Yılmaz, V. (2016). A proposed structural model for housewives' recycling behavior: A case study from Turkey. *Ecological Economics, 129,* 132–142. [Online]. Retrieved March 15, 2017,by: http://www.sciencedirect.com/science/article/pii/S0921800915306261

Babaei, A.A., Alavi, N., Goudarzi, G., Teymouri, P., Ahmadi, K., & Rafiee, M. (2015). Household recycling knowledge, attitudes and practices towards solid waste management. *Resources, Conservation and Recycling*, *102*, 94-100. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S0921344915300331

Best, H., & Kneip, T. (2011). The impact of attitudes and behavioral costs on environmental behavior: A natural experiment on household waste recycling. *Social Science Research, 40*(3), 917-930. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0049089X10002802

Bezzina, F.H., & Dimech, S. (2011). Investigating the determinants of recycling behaviour in Malta. *Management of Environmental Quality, 22*(4), 463-485. [Online]. Retrieved January 3, 2017, by: http://www.emeraldinsight.com/doi/pdfplus/10.1108/14777831111136072

Bortoleto, A.P., Kurisu, K.H., & Hanaki, K. (2012). Model development for household waste prevention behavior. *Waste Management, 32*(12), 2195-2207. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0956053X12002486

Botetzagias, I., Dima, A.F., & Malesios, C. (2015). Extending the theory of planned behavior in the context of recycling: The role of moral norms and of demographic predictors. *Resources, Conservation and Recycling*, *95*, 58-67. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S0921344914002663

Carmi, N., Arnon, S., & Orion, N. (2015). Seeing the forest as well as the trees: general vs. specific predictors of environmental behavior. *Environmental Education Research, 21*(7), 1011-1028. [Online]. Retrieved January 3, 2017, by: http://www.tandfonline.com/doi/abs/10.1080/13504622.2014.949626

CEPI (2015). *Key Statistics 2015: European Pulp and Paper Industry*. [Online]. Retrieved November 13, 2016, by: http://www.cepi.org/system/files/public/documents/publications/statistics/2016/FINALKeyStatistics2015web.pdf

Chen, M.-F., & Tung, P.-J. (2010). The moderating effect of perceived lack of facilities on consumers' recycling intentions. *Environment and Behavior, 42*(6), 824-844. [Online]. Retrieved January 3, 2017, by: https://www.researchgate.net/publication/249624616_The_Moderating_Effect_of_Perceived_Lack_of_Facilities_on_Consumers'_Recycling_Intentions

Chi, X., Wang, M.Y.L. & Reuter, M.A. (2014). Informal E-waste Collection and Household Recycling Alternatives: A Case Study in Taizhou of China. Journal of Cleaner Production (in press).

Choon, S.-W., Tan, S.-H., & Chong, L.-L. (2016). The perception of households about solid waste management issues in Malaysia. Environment, Development and Sustainability, 19(5), 1-16. [Online]. Retrieved January 3, 2017, by: http://link.springer.com/article/10.1007/s10668-016-9821-8?view=classic

Crociata, A., Agovino, M., & Sacco, P.L. (2015). Recycling waste: Does culture matter? *Journal of Behavioral and Experimental Economics, 55*, 40–47. [Online].]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S2214804315000075

Culiberg, B. (2014). Towards an understanding of consumer recycling from an ethical perspective. *International Journal of Consumer Studies, 38*(1), 90–97. [Online]. Retrieved January 3, 2017, by: http://onlinelibrary.wiley.com/doi/10.1111/ijcs.12068/abstract

Czajkowski, M., Hanley, N,. & Nyborg, K. (2017). Social norms, morals and self-interest as determinants of pro-environment behaviours: The case of household recycling. *Environmental and Resource Economics, 66*(4), 647–670. [Online]. Retrieved February 5, 2018,by: https://link.springer.com/article/10.1007/s10640-015-9964-3

DiGiacomo, A., Wu, D.W.-L., Lenkic, P., Fraser, B., Zhao, J., & Kingstone, A. (2018). Convenience improves composting and recycling rates in high density residential buildings. *Journal of Environmental Planning and Management, 61*(2), 309–331. [Online]. Retrieved February 1, 2018,by: https://doi.org/10.1080/09640568.2017.1305332

Du Toit, J., & Wagner, C. (2018). The Effect of a Weekly Comingled Kerbside Collection Service on Household Recycling in a Gated Community in Pretoria, South Africa. Sustainability, 10(4), 1-16. [Online]. Retrieved September 22, 2018 by: www.mdpi.com/journal/sustainability

Echegaray, F., & Hansstein, F.V. (2017). Assessing the intention-behavior gap in electronic waste recycling: the case of Brazil. *Journal of Cleaner Production, 142*(1), 180-190. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0959652616305285

Fielding, K., van Kasteren, Y., Louis, W. et al. (2016). Using individual householder survey responses to predict household environmental outcomes: The cases of recycling and water conservation. *Resources, Conservation and Recycling*, *106*, 90-97. [Online]. Retrieved February 5, 2018,by: https://www.sciencedirect.com/science/article/pii/S092134491530135X

Fiorillo, D. (2013). Household waste recycling: national survey evidence from Italy. *Journal of Environmental Planning and Management, 56*(8), 1125-1151. [Online]. Retrieved February 5, 2018,by: https://www.tandfonline.com/doi/abs/10.1080/09640568.2012.709180

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 Processes and Intergroup Relations, 14*(5), 623-635. [Online]. Retrieved January 3, 2017, by: https://www.researchgate.net/publication/228327748_Distinguishing_the_sources_of_normative_influence_on_p roenvironmental_behaviors_The_role_of_local_norms_in_household_waste_recycling

Gould, R.K., Ardoin, N.M., Biggar, M., Cravens, A.E., & Wojcik, D. (2016). Environmental Behavior's Dirty Secret: *The Prevalence of Waste Management in Discussions of Environmental Concern and Action. Environmental Management, 58*(2), 268-282. [Online]. Retrieved October 4, 2018, by: https://www.ncbi.nlm.nih.gov/pubmed/27234803

Guerrero, L. A., Maas, G., & Hogland, W. (2013). Solid waste management challenges for cities in developing countries. *Waste Management*, *33*(1), 220-232. [Online]. Retrieved February 5, 2018,by: https://www.sciencedirect.com/science/article/pii/S0956053X12004205

Huber, J., Viscusi, W.K., & Bell J. (2017). *Dynamic relationships between social norms and pro-environmental behavior: evidence from household recycling*. [Online]. Retrieved October 2, 2018, by: https://www.cambridge.org/core

Ittiravivongs, A. (2012). Recycling as habitual behavior: The impact of habit on household waste recycling behavior in Thailand. *Asian Social Science, 8*(6), 74-81. [Online]. Retrieved January 3, 2017, by: http://www.ccsenet.org/journal/index.php/ass/article/view/16538

Jafari, A., Heydari, J., & Keramati, A. (2015). Factors affecting incentive dependency of residents to participate in e-waste recycling: a case study on adoption of e-waste reverse supply chain in Iran. *Environment*, *Development and Sustainability,* 1-14. [Online]. Retrieved January 3, 2017, by: https://www.researchgate.net/publication/285043556_Factors_affecting_incentive_dependency_of_residents_to_ participate_in_e-waste_recycling_a_case_study_on_adoption_of_e-waste_reverse_supply_chain_in_Iran

Lakhan, C. (2016). Out of sight, out of mind: Issues and obstacles to recycling in Ontario's multi residential buildings. *Resources, Conservation and Recycling, 108*, 1-9. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0921344916300052

Latif, S.A., Omar, M.S., Bidin, Y.H., & Awang, Z. (2013). Environmental Problems and Quality of Life: Situational Factor as a Predictor of Recycling Behaviour. *Procedia - Social and Behavioral Sciences*, *35*, 682-688. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S1877042812004491

Laurijssen, J., Marsidi, M., Westenbroek, A., Worrell, E., & Faaij, A. (2010). Paper and biomass for energy? The impact of paper recycling on energy and CO_2 emissions. *Resources*, *Conservation and Recycling, 54*(12), 1208–1218. [Online]. Retrieved November 21, 2016, by: www.researchgate.net/publication/222918850

Lizin, S., Van Dael, M., & Van Passel, S. (2017). Battery pack recycling: Behaviour change interventions derived from an integrative theory of planned behaviour study. *Resources, Conservation and Recycling, 122*, 66-82. [Online]. Retrieved 5 February 2018, by: http://academic.naver.com/article.naver?doc_id=232917297

Martinho, G., Pires, A., Portela, G., & Fonseca, M. (2015). Factors affecting consumers' choices concerning sustainable packaging during product purchase and recycling. *Resources, Conservation and Recycling, 103,* 58-68. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0921344915300446

Miafodzyeva, S., & Brandt, N. (2013). Recycling behaviour among householders: synthesizing determinants via a meta-analysis. *Waste and Biomass Valorization*, *4*(2), 221–235. [Online]. Retrieved 5 February 2018, by: https://link.springer.com/article/10.1007/s12649-012-9144-4

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, *Resources, Conservation and Recycling, 113*, 40–52. [Online]. Retrieved March 15, 2017, by: http://www.sciencedirect.com/science/article/pii/S09213449916301185

Nazhad, M.M., & Paszner, L. (1994). Fundamentals of Strength Loss in Recycled Paper, *Tappi, 77*(9), 171-179, ISSN 0039-8241. [Online]. Retrieved November 21, 2016,by: https://open.library.ubc.ca/cIRcle/collections/ubctheses/831/items/1.0088893

Noor, Z.Z. (2016). *Towards Sustainable Household Waste Management in Areas: Determinants that Hindered the Recycling Activities in the City Johor Bahru, Malaysia*. [Online]. Retrieved April 20, 2017 by: https://malaysiacities.mit.edu/paperNoor

Oztekin, C., Teksoz, G., Pamuk, S., Sahin, E., & Kilik, D. (2017). Gender perspective on the factors predicting recycling behavior: Implications from the theory of planned behavior. *Waste Management, 62*, 290-302. [Online]. Retrieved 5 February 2018, by: https://www.ncbi.nlm.nih.gov/pubmed/28223075

Pakpour, A.H., Zeidi, I.M., Emamjomeh, M.M., Asefzadeh, S., & Pearson, H. (2014). Household waste behaviours among a community sample in Iran: An application of the theory of planned behavior. *Waste Management, 34*(6), 980-986. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0956053X1300514X

Park, J., & Ha, S. (2014). Understanding Consumer Recycling Behavior: Combining the Theory of Planned Behavior and the Norm Activation Model. *Family & Consumer Sciences Research Journal*, *42*(3), 278-291. [Online]. Retrieved 5 February 2018, by: http://onlinelibrary.wiley.com/doi/10.1111/fcsr.12061/abstract

Passafaro, P., & Livi, S. (2017). Comparing determinants of perceived and actual recycling skills: The role of motivational, behavioral and dispositional factors. *The Journal of Environmental Education, 48*(5), 347-356. [Online]. Retrieved October 1, 2018, by: https://doi.org/10.1080/00958964.2017.1320961

Pati, R.K., Vrat, P., & Kumar, P. (2006). Economic analysis of paper recycling vis-a` -vis wood as raw material. *International Journal of Production Economics, 103*(2), 489–508. [Online]. Retrieved November 21, 2016, by: https://www.researchgate.net/publication/223536838

Pati, R.K., Vrat, P., & Kumar, P. (2008). A goal programming model for paper recycling system. *Omega, 36*, 405 – 417. [Online]. Retrieved November 21, 2016, by: https://www.researchgate.net/publication/222569818

Saphores, J.-D., Ogunseitan, O., & Shapiro, A. (2012). Willingness to engage in a pro-environmental behavior: An analysis of e-waste recycling based on a national survey of US households. *Resources, Conservation and Recycling, 60,* 49–63. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0921344911002503

Seacat, J., & Boileau, N. (2018). Demographic and community-level predictors of recycling behavior: A statewide, assessment. *Journal of Environmental Psychology, 56*, 12-19. [Online]. Retrieved October 7, 2018, by: https://doi.org/10.1016/j.jenvp.2018.02.004

Sidique, S., Lupi, F., & Joshi, S. (2010). The effects of behavior and attitudes on drop-off recycling activities. *Resources, Conservation and Recycling, 54*(3), 163–170. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0921344909001608

Sun, M., Yang, X., Huisingh, D., Wang, R., & Wang, Y. (2015). Consumer behavior and perspectives concerning spent household battery collection and recycling in China: a case study. *Journal of Cleaner Production, 107*, 775-785. [Online]. Retrieved February 5, 2018,by:
https://www.sciencedirect.com/science/article/pii/S0959652615006484

Tabernero, C., & Hernandez, B. (2011). Self-efficacy and intrinsic motivation guiding environmental behavior, *Environment and Behavior* 43(5): 658–675. [Online]. Retrieved January 24, 2017, by:
http://journals.sagepub.com/doi/abs/10.1177/0013916510379759

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. *Resources, Conservation and Recycling, 79,* 11–20. [Online]. Retrieved March 15, 2017, by:
http://www.sciencedirect.com/science/article/pii/S0921344913000979

Tong, X., Nikolic, I., Dijkhuizen, B., van der Hoven, M., Minderhoud, M., Wackerlin, N., Wang, T., & Tao, D. (2018). Behaviour change in post-consumer recycling: Applying agent-based modelling in social experiment. *Journal of Cleaner Production, 187*, 1006-1013. [Online]. Retrieved October 2, 2018, by:
https://doi.org/10.1016/j.jclepro.2018.03.261

Triguero, A., Álvarez-Aledo, C., & Cuerva, M.C. (2016). Factors influencing willingness to accept different waste management policies: empirical evidence from the European Union. *Journal of Cleaner Production, 138*(1), 38-46. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0959652616305911

Virtanen, A., Henriksson, N., Nilsson, P., & Nissbeck M. (2013). Poly(A)-specific ribonuclease (PARN): an allostericaly regulated, processive and mRNA cap-interacting deadenylase. *Critical Reviews in Biochemistry and Molecular Biology, 48*(2), 192–209. [Online]. Retrieved 7 December 2016, by:
https://www.ncbi.nlm.nih.gov/pubmed/23496118

Wan, C., Shen, G., & Yu, A. (2014a). The role of perceived effectiveness of policy measures in predicting recycling behaviour in Hong Kong. *Resources, Conservation and Recycling, 83*, 141-151. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S0921344913002759

Wan, C., Shen, G., & Yu, A. (2014b). The moderating effect of perceived policy effectiveness on recycling intention. *Journal of Environmental Psychology, 37*, 55-60. [Online]. Retrieved 5 February 2018, by:
https://www.sciencedirect.com/science/article/pii/S027249441300087X

Wan, C., Shen, G., & Choi, S. (2017). Experiential and Instrumental Attitudes: Interaction effect of attitude and subjective norm on recycling intention. *Journal of Environmental Psychology, 50*, 60-79. [Online]. Retrieved 5 February 2018, by: https://www.sciencedirect.com/science/article/pii/S0272494417300221

Wang, Z., Guo, D., & Wang, X. (2016). Determinants of residents' e-waste recycling behaviour intentions: Evidence from China. *Journal of Cleaner Production, 137,* 850-860. [Online]. Retrieved January 3, 2017, by:
http://www.sciencedirect.com/science/article/pii/S0959652616310514

Welfens, M.J., Nordmann, J., & Seibt, A. (2016). Drivers and barriers to return and recycling of mobile phones. Case studies of communication and collection campaigns. *Journal of Cleaner Production, 132*, 108-121. [Online]. Retrieved 5 February 2018, by:
https://www.infona.pl/resource/bwmeta1.element.elsevier-6ebbc0e1-f541-36ba-98c8-6ff66b0bda19

Ylä-Mella, J., Keiski, R., & Pongrácz, E. (2015). Electronic waste recovery in Finland: Consumers' perceptions towards recycling and re-use of mobile phones. *Waste Management, 45*, 374-384. [Online]. Retrieved January 3, 2017, by: http://www.sciencedirect.com/science/article/pii/S0956053X15001348

Zen, I.S., Noor, Z.Z., & Yusuf, R.O. (2014). The profiles of household solid waste recyclers and non-recyclers in Kuala Lumpur. *Malaysia Habitat International*, *42* (2014), 83-89. [Online]. Retrieved 5 February 2018, by:
https://www.sciencedirect.com/science/article/pii/S0197397513001070