The Influence of Activating Environmental Values on Recycling Attitudes and Recycling Intentions

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Abstract

It is important for the environment to find out how people can get motivated to recycle their waste. Therefore, this study attempts to make a contribution to the literature on how to motivate people to recycle. It was examined what the role was of activating environmental values on recycling attitudes and recycling intentions. This was done with an online experiment. Participants filled in a questionnaire concerning their recycling attitude and recycling intention, where their environmental values got activated as well. It was expected that when participant's environmental values got activated, they would have a more positive recycling attitude and a stronger recycling intention. The results did not support these expectations. Methodological explanations were given for the unsupportive findings. Furthermore, exploratory analysis did show a gender difference in recycling intentions and also showed a relation between recycling attitudes and recycling intentions. Lastly, recommendation for future research were given as well.

On the 11th of December 2019, the 'European Green Deal' was presented (European Commission, 2019). The European Green deal has been set up to make the economy of the European Union (EU) sustainable. One key point of this deal is to achieve circular economy in Europe. Recycling is one facet that could be useful in order to achieve a circular economy (Di Maio & Rem, 2015). According to Di Maio and Rem (2015), arranging the economy to become circular is essential, as this would lead to materials being used repeatedly and therefore less material input is needed, which benefits the economy. This is of critical importance for the future, especially when thinking of the depleting resources the world is facing (Stern, 1992).

Besides the advantage towards a more circular economy, recycling has direct environmental advantages as well (Chen & Tung, 2010; Latif, Omar, Bidin, & Awang, 2012a). As recycling waste would not only reduce waste production, recycling waste would also give the materials a new life (Chen & Tung, 2010). The reduction of waste itself will reduce greenhouse gasses (Bogner et al., 2008), which is vital in addressing the global temperature rise. Furthermore, reusing materials is less CO2 emitting, since the production process of using recycled materials is less polluting than using new resources from the environment (Acuff & Kaffine, 2013).

It is for these aforementioned reasons the EU has set a binding target for its members to reach a 65 percent municipal recycling rate by 2030 (European Commission, 2015). The municipal recycling rate is the portion recycled waste of a country's total waste generated by its citizens. With the knowledge that on average every citizen in the EU produces half a ton of municipal waste, this is a profound aspiration (European Commission, 2020). Moreover, the most recent recycling rate number (from 2018) was 47 percent (Eurostat, 2020), so there seems to be a long way to go before reaching the 2030's goal. It is therefore important to take steps in increasing municipal recycling. To increase the recycling rates, it is first of all necessary that citizens are motivated to do so. The current study attempts to contribute to the existing literature on how to motivate people to recycle their waste.

In the current study, a comparable definition for recycling is used as by Geiger, Steg, van der Werff, and Ünal (2019), which is: "The collection of waste by individuals, which allows the materials to be reused". Certainly, recycling can be seen as an example of pro-environmental behavior. Earlier research has shown that behaving pro-environmentally can be predicted by the strength of someone's pro-environmental values (Latif, Omar, Bidin, & Awang, 2012b; Novoradovskaya, Mullan, & Hasking, 2020). This effect can be explained best by Schwartz's value theory (Schwartz, 1992). According to Bardi and Schwartz (2003)

values represent what is important for us in our lives. It can be seen as expansive goals, which are transcendent over different situations and actions. Schwartz's value theory (1992) states there are 10 universal values, which are distinguishable by the type of goal or motivation they represent. The achievement value, for instance, is characterized by the goal to have personal success by demonstrating competence according to current cultural standards. Another example is the universalism value, which is characterized by the goal to understand, appreciate, tolerate and protect people and the environment. For every person these values are relevant. However, a particular value may be very important for one person and less important for another person. When a value is important for a person and relevant for the situation it will influence behavior (Schwartz, 2012). This explains why people who value the environment (I.e., have strong pro-environmental values) will most likely show pro-environmental behavior.

Not only do pro-environmental values explain specific pro-environmental behavior, it should also be generalizable over different situations and be stable over time, since this is a characteristic of values (Schwartz, 2012). Therefore, if someone has strong pro-environmental values, she would be using the bike more often instead of using the car, and would recycle her waste, or buy sustainable products for example. Although this line of thinking seems to be reasonable, people do not always act pro-environmentally across different situations. In the tourism context for example, people tend to be acting less environmentally friendly compared to the home context (Dolnicar & Grün, 2009). Moreover, even people who are active in environmental organizations at home tend to be less environmentally friendly on vacation (Juvan & Dolnicar, 2014). Being in a different situation, such as on vacation, can thus lead people to be less environmentally friendly. This is even the case for people who are active in environmental organizations at their place of residence, who most likely value the environment. Arguably, it can be stated that having strong pro-environmental values is not predictive of pro-environmental behavior over every situation.

Verplanken and Holland (2002) also argue that although values are relatively stable constructs, they do not always influence behavior. According to the researchers, most people are not always automatically thinking about their values, therefore values need to be activated to have an influence on behavior. In their study (Verplanken & Holland, 2002) they showed consistently over six different experiments that when people's values were activated in an irrelevant task, they subsequently respondent in line with the activated value. This was also the case when environmental values were activated. When environmental values were primed, participants were more likely to choose the more environmentally friendly television in a

consumer choice task (Verplanken & Holland, 2002, p. 437). This gives an indication that activating environmental values may influence consumer decisions.

Building on this idea of value activation, Hahnel, Ortmann, Korcaj and Spada (2014) also activated environmental values among their participants. Again, it was tested if this would influence consumer decisions, however, this time on the decision whether or not to buy an electric car. In line with the findings of Verplanken and Holland (2002) it was shown that when participants were primed, they were willing to pay more for an electric car. In all likelihood, activating environmental values increases willingness to pay for sustainable products, as this serves the value-congruent goals (Hahnel et al., 2014).

Thus, the aforementioned literature indicates that activating environmental values has a positive influence on sustainable consumer behaviour. When environmental values are primed, people behave in line with the value-congruent goals. Considering that recycling can also be seen as environmental behavior, it would be interesting to test if activating environmental values also has positive effects on recycling behaviour. In a recent meta-analysis (Geiger et al., 2019) it has already been shown that environmental values are related to recycling. However, activating environmental values in the context of recycling behavior has not been studied before. The goal of the current study is to contribute to the recycling literature by testing the role of activating environmental values in the recycling context.

Several studies have shown that someone's recycling attitude is a good predicter of recycling behaviour (Geiger et al., 2019; Nigbur, Lyons, & Uzzell, 2010; Schultz, Oskamp, & Mainieri, 1995). Hence, it would be valuable to examine if activating someone's environmental values would affect her recycling attitude. Presumably, when people's environmental values get activated, they evaluate recycling as more positive than when people's environmental values do not get activated. Thus, environmental value activation leads people to have a more favourable recycling attitude than people whose environmental values did not get activated (Hypothesis 1). This first hypothesis is supported by the value-attitude-behavior model (Homer & Kahle, 1988). This model states that values are central in developing attitudes, and as a result, these attitudes lead to performing certain behavior. In addition, according to Verplanken and Holland (2002, p. 435) attitudes are considered to be the functional expression of values. Therefore, activating a specific value, such as environmental values, would most likely influence attitudes that are related to this value, such as recycling attitudes in the current study.

Furthermore, it would be valuable to measure people's intention to recycle as well. Intention to recycle has been studied quite often in the context of recycling (Chen & Tung,

2010; Knussen, Yule, MacKenzie, & Wells, 2004; Tonglet, Phillips, & Read, 2004). According to the theory of planned behavior (Ajzen, 1991) intention is the best predictor of actual behavior. Therefore, increasing people's intention to recycle their waste could increase actual recycling behavior as well. Environmental values have already been linked to the intention to recycle (Han, Kiatkawsin, Ryu, Jung, & Kim, 2019). Based on this, it is hypothesized that when environmental values get activated in the present study, this will increase people's intention to recycle (Hypothesis 2). If activation of environmental values influences the intentions of people to recycle, this would indicate the potential of value activation in recycling behavior, considering the direct effects of intention to recycle on actual recycling behavior (Boldero, 1995, p. 455).

Lastly, the hierarchical structure will be tested in the current study. To be more specific, it is hypothesized that activating environmental values will lead to more positive recycling attitudes, and as a result, the more positive recycling attitudes will lead to stronger recycling intentions (Hypothesis 3). This hypothesis is based on the theory of planned behavior (Ajzen, 1991), which describes that attitude towards specific behavior is one of the predictors of people's intention to perform this behavior. Accordingly, in the study by Tonglet and colleagues (2004) it was found that attitude towards recycling was the most significant and the strongest predictor for recycling intentions. Likewise, De Young (1990) shows the relationship between attitudes and intentions to recycle in his study and concluded that positive recycling attitudes explained the recycling intentions. Therefore, it can be assumed that increasing someone's positive attitude towards recycling would lead to increased intentions to recycle waste.

To summarize, in the current study it will be tested if activating environmental values lead to more positive recycling attitudes and higher recycling intentions. Furthermore, it will be tested if more positive recycling attitudes, as a result of the activated values, predict the recycling intentions. The method for activating environmental values is derived from the study conducted by Hahnel and colleagues (2014, Study 1). In their study environmental value activation was operationalized by letting the participants rate pictures on its attractiveness. In the value activation condition the pictures displayed nature landscapes, whereas in the control condition the pictures displayed residential buildings. The control condition in the current study, however, will not be with picture of buildings. In the control condition in the current study participants will do the environmental value activation task after answering the questions about their recycling attitude and intention. Thus, participants in the control condition will do the study in a different order than the manipulation condition, so

that the value activation will not affect their answers concerning their recycling attitude and recycling intention. Furthermore, the present study is an online survey, every part of the study will be done online. It is expected that when participant's environmental values get activated, they evaluate recycling as more positive and have a stronger intention to recycle compared to the participants in the control condition.

Method

Sample size

In the study conducted by Hahnel and colleagues (2014) it was found that the effect size of the value activation task is $\eta_p^2 = .06$, which indicates a medium effect size (Richardson, 2011). In the current study a comparable value activation task is used as in the study by Hahnel and colleagues (2014), therefore their found effect size was used for the power analysis. Hence the effect size for the power analysis was set to f = .25, which was calculated from $\eta_p^2 = .06$ (Lenhard & Lenhard, 2016). Furthermore, with the power = .80 and alpha = .05 the power analysis indicated a sample size of 125 participant that would be needed in the current study (G*Power; Faul, Erdfelder, Buchner, & Lang, 2009). Data collection stopped when the sample size of 125 participants was achieved. After 18 days of data collection 128 people participated in the study and data collection stopped.

Participants

Only participants who were living in the Netherlands could participate. The participants were gathered via different methods. Since the study was conducted online with a web questionnaire, the link of this questionnaire could be shared via different canals. First of all, this was done by sharing the link via WhatsApp to people from the researcher's own environment. It was stated in this message that the easiest way to open the link was with web WhatsApp on a pc or laptop, as the questionnaire could only be done on a pc or laptop. Secondly, the same message was also spread using Facebook. Lastly, participants were also gathered with the SONA system of the Radboud University. The participants who took part in the study via the SONA system received 0.5 SONA credits. First year's bachelor students of psychology at the Radboud University need to reach an amount of SONA credits to complete a course for their propaedeutic year. Only participants who understood the Dutch language could participate, because the entire questionnaire was set out in Dutch. In addition, participants had to be at least 18 years old. One participant was excluded from analysis based on this criterion. Participants who opened the questionnaire on their phone, got shown a message stating that the questionnaire can only be filled in on a laptop or pc and it was asked if they would open the link again on a device as such. The data cases, which were collected by

opening the questionnaire on phones, were excluded from analysis. Furthermore, four responses were excluded from analysis due to incompletion of the questionnaire. Another exclusion criterion was based upon the completion time of the participants. Since a very short completion time gives a good indication if the questionnaire is filled in carelessly or not (Leiner, 2019), this can be seen as a sensible exclusion criterion. Moreover, it makes sense to exclude participants who took too long to complete the study, as there is a possibility that participants stopped during the study and finished the survey later on. If a participant would have done this, the environmental value activation might not have worked, since it cannot be assumed that the value is still active when the participant finishes the survey at a later moment. Therefore, the method proposed by Leys, Ley, Klein, Bernard, and Licata (2013) to detect outliers was used to identify the boundary criteria for when a participant took too long or too short for completing the questionnaire. Using this method, it was established that when participants took longer than 460.63 s, they were excluded from further analysis. This method did not result in an appropriate minimum duration time for the task (the minimum boundary criterion was negative). Therefore, to detect outliers based on a too short completion time, a boxplot was derived from the duration time of the participants. Fourteen participants were excluded form analysis based on their completion time. Lastly, one participant was excluded from further analysis, because this person indicated to be transgender. Since, the factor gender was examined as well, it is impossible to include this person, as this group would consist of one person. All in all, this led to 108 participants, who were included for the analysis (58 females, 50 males, $M = 27.54$, $SD = 11.49$).

Materials

The questionnaire was designed using Qualtrics (https://www.qualtrics.com). All the participants could conclude the entire study using the link referring to the survey. In the next subsections every part of the questionnaire is described.

Environmental value activation task. The task was part of the questionnaire and based on the same value activation task as in Study 1 in the work of Hahnel and colleagues (2014). Similar as in their study, the participants had to evaluate ten pictures on its attractiveness. The pictures were all pictures of natural landscapes. The pictures were rated from 1 (*not attractive at all*) to 10 (*very attractive*). It was also asked how much they would like to be in the environment of each picture. This was rated from 1 (*not at all*) to 10 (*very much*). The addition of this question makes the value activation task different from the value activation task developed by Hahnel and colleagues (2014). This question was supposed to make the displayed environment be processed more attentively, as the self is related in this

question. As a result, adding this question to the task was expected to support the environmental value activation.

Recycling attitudes. To measure the attitudes of the participants about recycling a scale was used, which has been used in earlier research (Chen & Tung, 2010). The scale they developed for measuring recycling attitudes was compiled from earlier research (Knussen et al., 2004; Tonglet et al., 2004). In the study conducted by Chen and Tung (2010) this scale for measuring recycling attitudes appeared to be a reliable scale ($\alpha = .88$). In the current study, the items were translated to Dutch, so it was understandable for the target population. Also, the definition for recycling was stated, so it was clear for the participants what was meant with recycling. This definition was: "The collection and separation of waste, which allows materials to be reused", but than in the Dutch language as this entire questionnaire was in the Dutch language. This definition is based on the definition given by Geiger and his colleagues (2019). The items were statements about recycling and participants had to rate each statement on a seven-point Likert scale. The labels for each level were in ascending order: *Strongly disagree* (1), *disagree* (2), *somewhat disagree* (3), *neither agree nor disagree* (4), *somewhat agree* (5), *agree* (6), *strongly agree* (7). Example items were: "Recycling is good" or "my feelings about recycling are positive". In total, there were 10 items for this subscale, therefore a maximum score of 70 and a minimum score of 10 could be derived. To calculate the dependent variable the average attitude was calculated, so the total score for each participant was divided by 10 ($M = 6.22$, $SD = .60$). The attitude towards recycling scale appeared to be a reliable measurement in the current study ($\alpha = .79$).

Recycling intentions. Intention to recycle was operationalized in a similar way as in the study by Chen and Tung (2010). The participants were asked to fill in their intention to recycle several types of waste in the coming four weeks. In addition, the definition for recycling was stated again. The types of waste were: Paper, plastic, glass, textiles and vegetable fruit and garden (VFG) waste, which are the main recyclables in the Netherlands (Dijkgraaf & Gradus, 2017). The municipalities in the Netherlands are obliged to collect these types of recyclable wastes. Therefore, every citizen in the Netherlands has the possibility to recycle the waste, which belongs to these waste types. Overall, there were 5 types of waste and these had to be rated from 1 (*No intention*) to 7 (*Strong intention*). Hence a maximum score of 35 and a minimum score of 5 could be derived for this subscale. The dependent variable for intention to recycle was calculated by dividing the total score by 5 for each participant ($M = 5.82$, $SD = .94$). This measurement for intention to recycle should be interpreted with caution, because the scale had a moderately low reliability ($\alpha = .62$).

Procedure

When participants opened the survey link, they were introduced to the terms and conditions of the study concerning their anonymity and handling of the data. Additionally, information was given about what the study was about; Specifically, it was stated that the study was about the environment and recycling. A definition of recycling was given as well. After reading this information and the terms and conditions, participants had to declare if they agreed of disagreed with the terms and conditions. When participants disagreed, the questionnaire ended for them. When participants agreed, they were directed to the next section. What the next section was for the participants, was randomly determined. The participants were randomly assigned to the priming condition or the control condition. When participants were assigned to the priming condition, they started with the environmental value activation task first. Afterwards, they filled in their recycling attitude and their recycling intention. At the end, they filled in their demographic information. In the control condition, the order was the other way around. The participants started with filling in their recycling attitudes and intentions. Afterwards, they did the environmental value activation task and again, at the end, they filled in their demographic information. The environmental value activation task could not influence their recycling attitudes or intentions this way, since the value activation task was done after filling in these subscales.

Analysis

The data were analyzed using SPSS version 24. Two One-Way ANCOVA's were performed with Condition (Priming/Control) as independent variable and either recycling attitude or recycling intention as dependent variables. To control for age and gender in the analyses, both ANCOVA's included age and gender as covariates. This was done to remove potential biases of gender and age on the dependent variables (Botetzagias, Dima, & Malesios, 2015; Oztekin, Teksöz, Pamuk, Sahin, & Kilic, 2017). Furthermore, a simple mediation analysis was conducted as well. The simple mediation analysis was performed to examine if more positive recycling attitudes, which are the results of the environmental value activation, mediates the relationship with stronger recycling intentions. This simple mediation analyses was done by the method introduced by Hayes (2013) using the PROCESS macro v3.5 (Model 4). The outcome variable in this analysis was intention to recycle, the independent variable was Condition (Priming/Control) and the mediator was recycling attitude. The number of bootstrap samples for this analysis was set to 5000. The mediation effect was significant if the confidence interval (95%) of the indirect effect did not overlap zero (Hayes, 2013).

Results

First of all, histograms were plotted from the dependent variables to examine the distributions in the sample. As is shown in Figure 1 the scores on recycling attitude seems to be skewed negatively. Similarly, the scores on recycling intention seems to be skewed negatively as well (Figure 2).

Confirmatory analysis

Two separate One-Way ANCOVA's were performed. The first One-Way ANCOVA was executed with recycling attitude as dependent variable, Condition (Priming/Control) as independent variable, and gender and age as covariates. Importantly, the results of this analysis should be interpreted with caution, since the assumption of normality and the assumption of homogeneity of variance could be violated. The Levene's test is significant $F(1, 106) = 12.51$, $p = .001$, which gives an indication that the group variances are not equal. Also, looking at the distribution of the standardized residuals in the control condition (Figure 3), it seems to be skewed negatively. Apart from that, the results of this analysis indicate there was no significant main effect of gender $F(1, 104) = 3.64$, $p = .059$, $\eta_p^2 = .03$ and age $F(1, 104) = 1.29$, $p = .259$, $\eta_p^2 = .01$ on recycling attitude. Furthermore, there is no significant main effect of the conditions on recycling attitude, controlling for age and gender $F(1, 104) = 0.90$, $p = .347$, $\eta_p^2 = .01$.

The second One-Way ANCOVA was executed with recycling intention as dependent variable, Condition (Priming/Control) as independent variable, and gender and age as covariates. The main effect of gender on recycling intention was significant $F(1, 104) = 11.70$, $p = .001$, $\eta_p^2 = .10$. Also, the main effect of age on recycling intention was significant as well $F(1, 104) = 23.40$, $p < 0.001$, $\eta_p^2 = .18$. However, there was no significant effect of the conditions on intention to recycle after controlling for gender and age $F(1, 104) = 2.94$, $p = .089$, $\eta_p^2 = .03$. All assumptions were met in this analysis.

The simple mediation analysis demonstrated that the indirect effect of Condition on recycling intention via recycling attitude was found to be non-significant as the percentile bootstrap confidence interval did contain zero [-0.06; 0.22].

Exploratory analysis

To further examine the role of gender on recycling intention a One-Way ANOVA was conducted with gender (Male/Female) as independent variable and recycling intention as the dependent variable. Since the two groups in this analysis are reasonably equally distributed ($n_{female} = 58$ and $n_{male} = 50$), the test is robust for violation of normality (Field, 2009). Leven's test was non-significant $F(1, 106) = .02$, $p = .888$, meaning no violation of the assumption of

homogeneity. The analysis demonstrated a significant effect of gender on recycling intention $F(1, 106) = 13.30$, $p < .001$, $\eta^2 = .11$. Females had a significantly higher intention to recycle ($M = 6.11$, $SD = .88$) than males ($M = 5.48$, $SD = .91$).

Lastly, the role of recycling attitude on predicting recycling intention was tested. Therefore, a simple linear regression analysis was performed. The results suggest that recycling attitude explained 14% of the variance of recycling intention $F(1, 106) = 17.07$, $p < .001$, $R^2 = .14$. Recycling attitude significantly predicted recycling intention $b = 0.59$, $t = 4.13$, $p < .001$.

Discussion

The goal of the present study was to examine the role of activating environmental values in the recycling context. Specifically, it was tested if activating environmental values would influence someone's recycling attitude positively (Hypothesis 1) and would increase someone's recycling intention (Hypothesis 2). To rule out potential bias by gender or age on someone's recycling attitude or recycling intention (Botetzagias et al., 2015; Oztekin et al., 2017), these factors were controlled for in the analyzes. Lastly, it was tested if the increased recycling intentions were the result of the more positive recycling attitudes, induced by the environmental value activation (Hypothesis 3).

The results did not support the first hypothesis. Activation environmental values did not influence someone's recycling attitude positively. There was no significant difference on the participants' recycling attitudes between the priming condition and the control condition. Therefore, it cannot be concluded that environmental value activation influences someone's recycling attitude. As attitudes are the functional expression of values (Verplanken & Holland, 2002, p.435), it was expected that activating values, such as environmental values in the present study, would influence a related attitude, such as recycling attitude. However, the findings do not support this expectation. Disputably, this can be explained by the sample's distribution of the score on the recycling attitude scale. As can be seen from the distribution of the recycling attitude scores (Figure 1), the histogram is skewed negatively. This seems to suggest that the scores on the recycling attitude scale are clustered at the high end of the scale. Also, the considerably high mean ($M = 6.22$) and low standard deviation ($SD = .60$) seem to suggest the same. Looking at the study by Chen and Tung (2010), who developed the scale used in the current study, it can be seen that they identified a relatively lower mean for recycling attitude ($M = 5.74$) than in the current study. Also, in an earlier study which used similar items for measuring recycling attitude, the identified mean was relatively lower as well (Knussen & Yule, 2008, $M = 5.86$). Apparently, the participants in the current study's

sample evaluated recycling as quite positive, independent of the condition they were assigned to in the experiment. Therefore, the variation of the scores on recycling attitude is clustered at the high end of the scale, which leads to less variation between the two conditions. Consequently, it is harder to find a significantly higher recycling attitude in the Priming group than in the Control group.

Furthermore, the results do not support Hypothesis 2. The activation of environmental values did not increase the intention to recycle. No significant difference was found between the priming condition and the control condition on intention to recycle. Similar as for recycling attitude, the distribution of intention to recycle seems to be skewed negatively as well (Figure 2). Noteworthy, is the frequent number of maximum scores on the recycling intention scale. Apparently, a considerable portion of the sample indicated to have a strong intention to recycle all the types of wastes that were asked in the survey. Possibly, this can be explained by the regulations concerning recycling in the Netherlands. In the Netherlands the municipalities are obliged to provide ways to collect paper, plastic, glass, textiles and vegetable fruit and garden (VFG) waste (Dijkgraaf & Gradus, 2017). Also, the recycling rates are already relatively high in the Netherlands compared to other countries (Dijkgraaf & Gradus, 2017). Therefore, it could be the case that a portion of the sample of the present study already recycles all these waste types, which led them to indicate to have a strong intention to recycle all these waste types. As a result, this could explain the high frequency of maximum scores on the recycling intention scale. Consequently, this might have skewed the data, which might also explain the non-significance of environmental value activation on recycling intentions.

Lastly, Hypothesis 3 is also not substantiated by the results. Recycling attitudes did not mediate the influence of environmental value activation on recycling intentions. The primary and most straightforward explanation for the non-significance is, because the environmental value activation did not influence recycling attitudes or recycling intentions. Since there is no effect of environmental value activation found on recycling attitude or recycling intention, there was also no mediation found.

Besides the distributions of the dependent variables, there is also a more methodological explanation conceivable for the insignificance of the environmental value activation task on recycling attitudes and recycling intentions. As was stated earlier, the environmental value activation task in the current study is derived from the study by Hahnel and colleagues (2014), however, there are differences. First of all, the control conditions were different. In the current study participants in the control condition performed the value

activation task after answering to the intention and attitude questions. In Hahnel and colleagues' (2014) study, however, the control condition performed the environmental value activation task with different stimuli. Specifically, the participants in Hahnel and colleagues' (2014) study rated pictures of natural landscapes in the value activation condition, whereas rated pictures of residential buildings in the control condition. Thus, the difference in the current study between the two condition was the order of the survey, whereas the difference in the study by Hahnel and colleagues (2014) was the stimuli, which were used. It might be that the environmental values of the participants in the control condition in the current study got activated as well and therefore no significant difference was found between the two conditions. This activation might have occurred by simply asking the participants for their recycling attitude and recycling intention. Since values can also get activated if the situation implicitly asks for this value to become active (Verplanken & Holland, 2002), asking people for their attitude or intention concerning recycling might activate environmental values. Hence, the participants in the control condition might have had activated environmental values as well. If this was the case, this can explain why Hypothesis 1 and 2 were not supported by the results.

Furthermore, another methodological difference between Hahnel and colleagues' (2014) study and the current study might have led to activation of environmental values in the control condition. In the study by Hahnel and colleagues (2014) the participants were told they took part in a marketing study, assessing their consumer perceptions for advertisements. To avoid deception, in the current study, all the participants were told the study's goal was to assess how they thought about aspects of the environment and recycling in particular. This might already have led to activated environmental values in the participants, as they had become aware that the study is about the environment. As a result, the environmental values of the participants in the control condition were activated as well, which could have led to the non-significant difference between the priming condition and the control condition.

Besides the results concerning the main hypotheses also additional aspects were assessed in the analyzes. These findings were not part of the main purpose of the study; However, these findings can contribute to the recycling literature. First of all, there was a significant effect of gender on recycling intention. The explorative analysis demonstrated that females have a stronger intention to recycle than males. This is in line with the findings of (Oztekin et al., 2017). They also demonstrated that females possessed higher levels of intention to recycle compared to males. Although Oztekin and his colleagues (2017) also found that females had stronger recycling attitudes than males, this was not shown in the

current study. This could be due to the difference in sample sizes, as the sample size of the current study is considerably lower. It is important to find out these gender differences in recycling behavior, as this could help identifying target populations for a recycle intervention. When the literature can identify a specific population, which has a low recycling intention for example, a recycling campaign can specifically focus on this population to increase their intention to recycle waste.

In addition, the exploratory analysis also showed that someone's recycling intention can be predicted by her recycling attitude. This is in line with earlier research (De Young, 1990; Tonglet et al., 2004), which demonstrated this relationship as well. Moreover, this finding is congruent with the theory of planned behavior (Ajzen, 1991). This theory states that intention is the best predictor of behavior and that one of the predictors of intention is someone's attitude towards the specific behavior. Therefore, the finding that someone's recycling attitude predicts her intention to recycle is in line with the theory of planned behavior. This theory is also frequently supported in the recycling literature (See for example: Botetzagias, Dima, & Malesios, 2015; Chan & Bishop, 2013). Thus, by influencing someone's recycling attitude positively, someone's intention to recycle would increase as well. Consequently, this could increase actual recycling behavior as well (Boldero, 1995, p. 455).

Limitations

There are some limitations in the current study, which should be acknowledged as well. First of all, the sampling method used is not optimal. Participants were gathered in several ways. One of those ways was by sending the link for the questionnaire via WhatsApp to people from the researcher's own environment. Another way was by sharing the link on the researcher's own Facebook page. Both of these methods could have contributed to a bias. As the researcher himself has an interest in sustainability and is concerned with the environment, it could be that people in the researcher's environment are biased towards the environment as well. Specifically, by spreading the survey in the researcher's own environment it cannot be ruled out that the participants had a bias concerning recycling. Arguably, this could also explain why the scores on recycling attitude in the sample seems to be clustered on the high end of the scale.

Secondly, another limitation is that the study was conducted in an online environment. Therefore, it cannot be checked what participants were doing during filling in the questionnaire. It could be the case that participants got distracted by their phone during the environmental value activation task for example. This would presumably influence whether or

not the value activation would have been effective. Thus, the lack of control, which is inevitable in an online experiment, could have led to less focus of the participants on filling in the survey. Subsequently, this could have affected the results of the current study.

Future research

As was stated in the beginning, the EU has set a binding target for its members to reach a 65 percent municipal recycling rate by 2030 (European Commission, 2015). A first step reaching this goal is to motivate citizens to recycle their waste. Therefore, it is essential to expand the recycling literature and to find ways to motivate people to recycle their waste. Future research on this subject may further explore the role of activating environmental values in motivating people to recycle their waste. The fact that the hypotheses of the current study did not find support, gives no conclusive evidence to assume there is no role for environmental value activation in the recycling literature. Earlier research has already demonstrated the potential in activating values on behavior (Maio, Pakizeh, Cheung, & Rees, 2009) and also activating environmental values in particular (Hahnel et al., 2014; Verplanken & Holland, 2002). Therefore, there is still ample reason to believe that activating environmental values could contribute to motivating people to recycle. Moreover, several methodological explanations were given for the disconfirming findings of the current study. Thus, the findings of the current study do not mean that activating environmental values cannot influence recycling attitudes or recycling intentions.

Future studies could examine if a different operationalization of activating environmental values can possibly influence recycling attitudes or recycling intentions. Verplanken and Holland (2002) stated about value activation: “Activation of course occurs automatically when values are the primary focus of attention”. Therefore, using provocative stimuli to activate environmental values might be more effective. One can think about confronting pictures of the enormous impact humanity has on the environment or using disturbing facts about the detrimental impact of humans on the global environment. By using provocative stimuli environmental values might get activated more easily, since it would get more attention.

Conclusions

This research examined the role of activating environmental values on recycling attitudes and recycling intentions. The results do not support that environmental values influence recycling attitudes or recycling intentions. However, there are several methodological issues discussed, which can explain this. Furthermore, exploratory analyses were conducted as well. These findings indicate that females have stronger recycling intention

than males. Moreover, it was shown that someone's recycling intention can be predicted by someone's recycling attitude.

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Figures

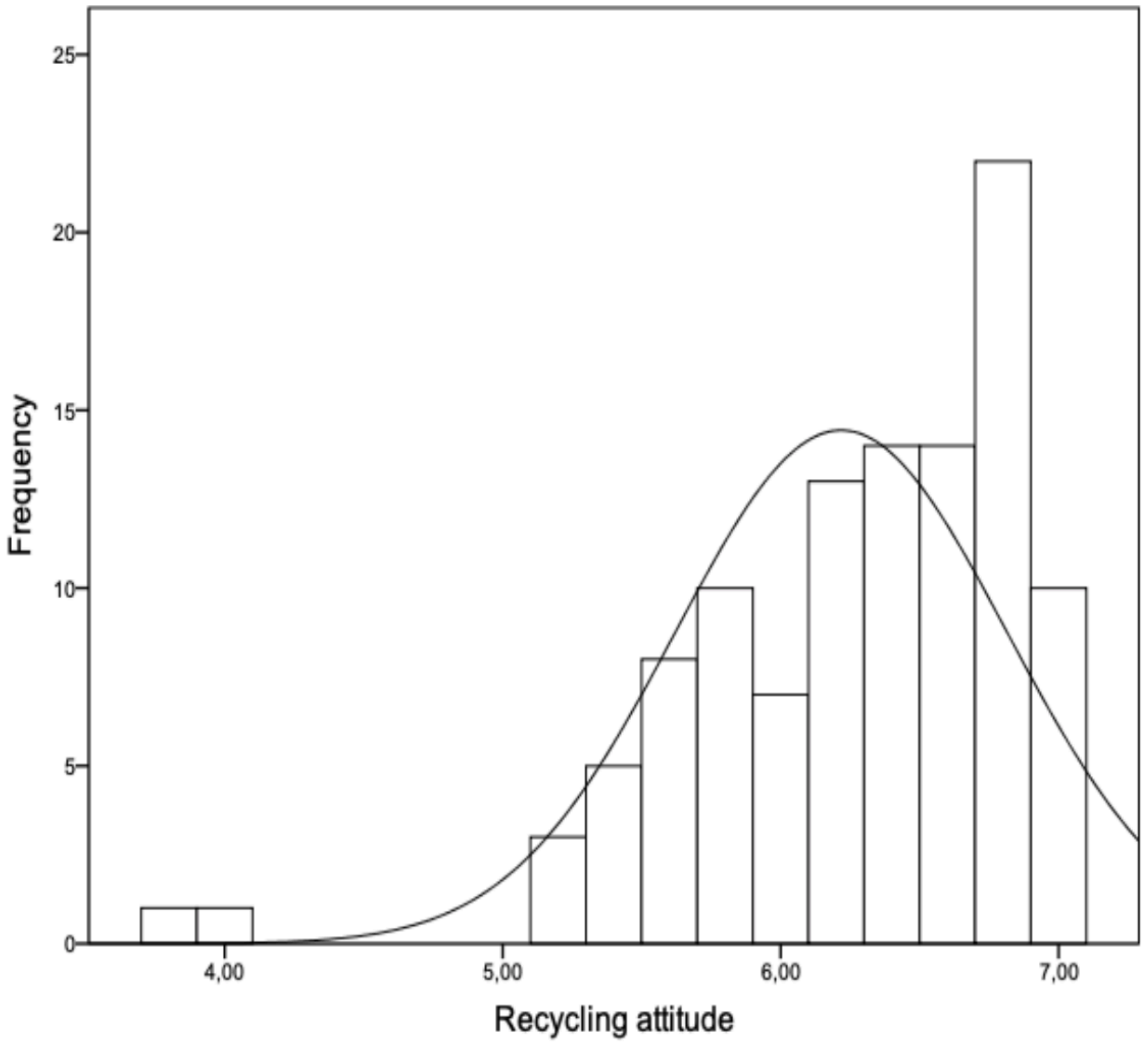

Figure 1. The distribution of recycling attitude with the normal distribution line included.

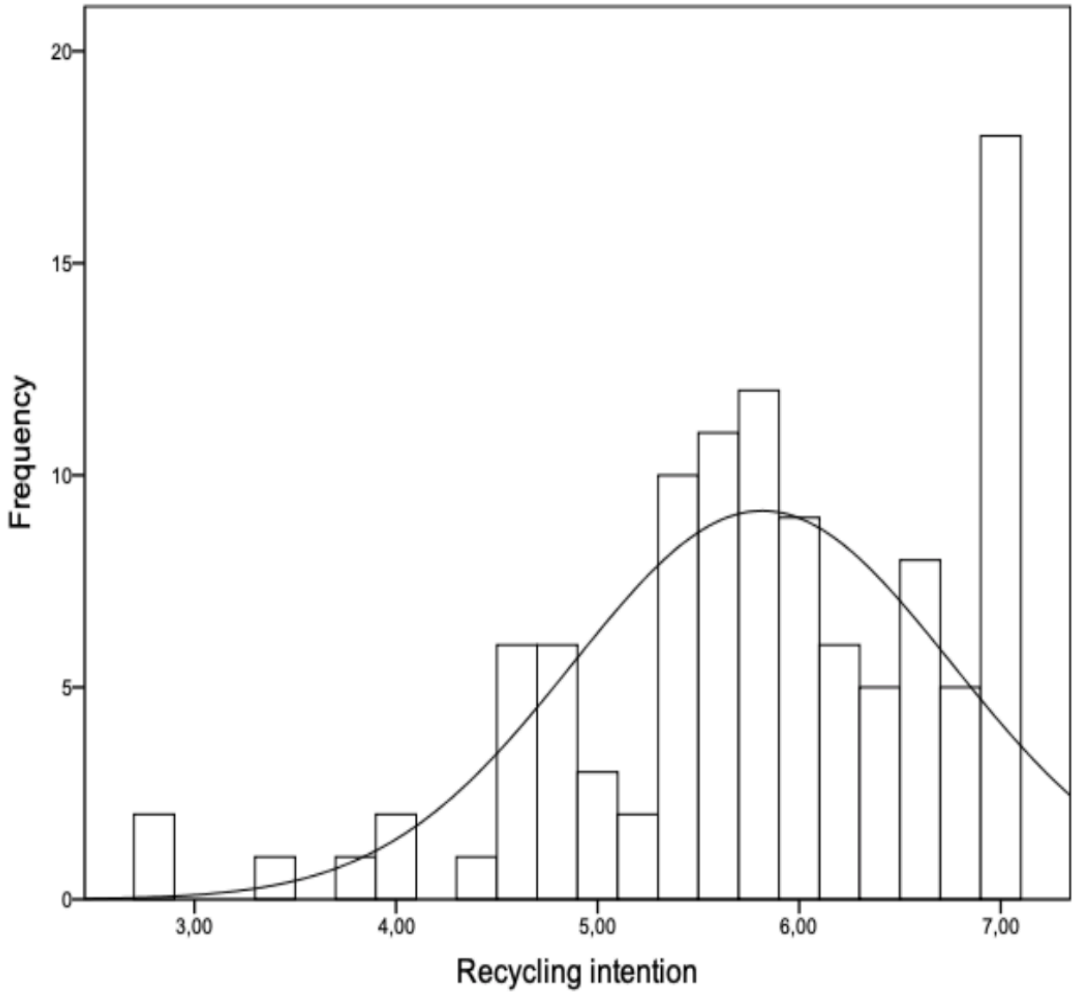

Figure 2. The distribution of recycling intention with the normal distribution line included.

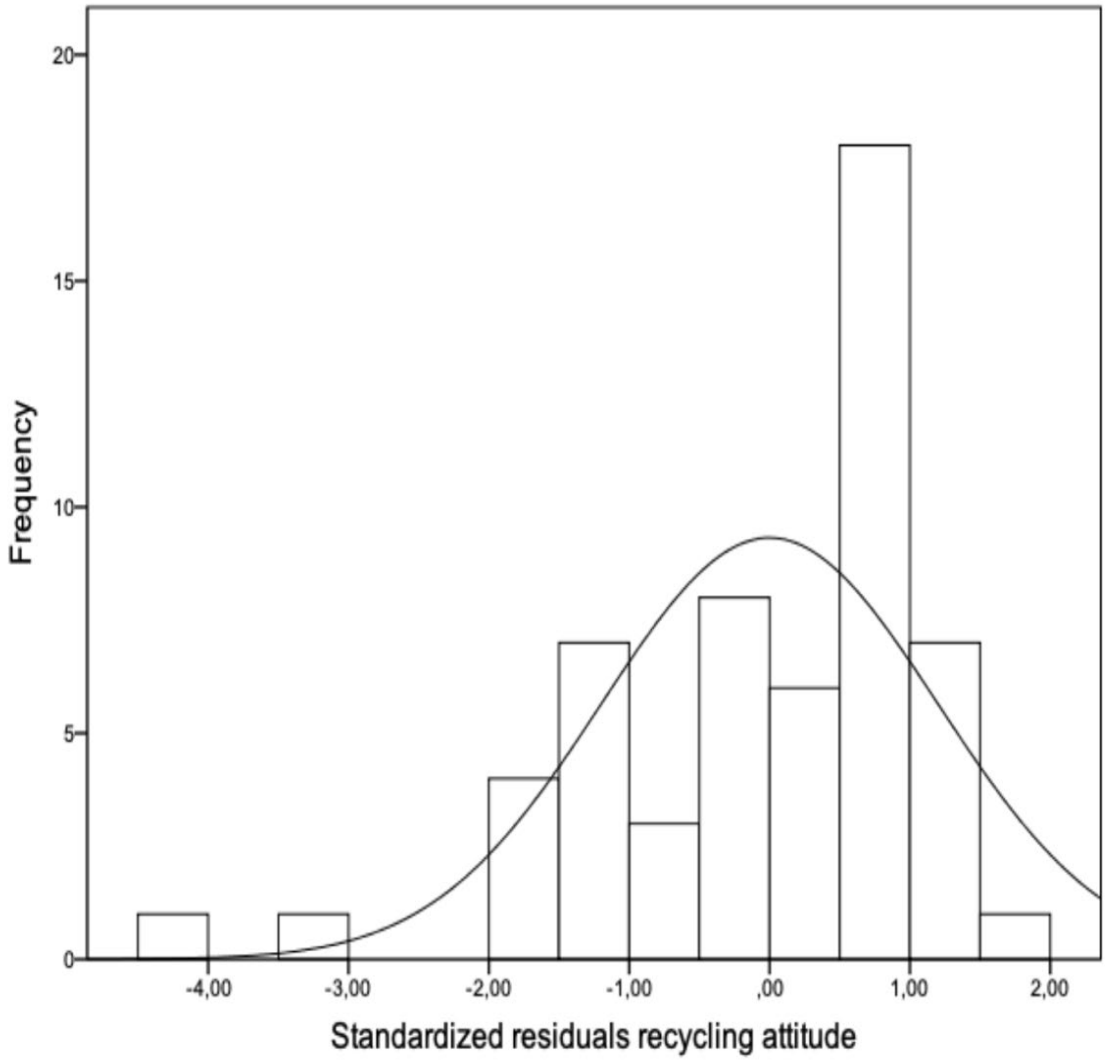

Figure 3. The distribution of the standardized residuals of recycling attitude with the normal distribution line included