

# Promoting aluminium packaging recycling among teenagers: workshops and SMS messages



This paper is a summary of the Doctoral Thesis “Environmental communication in the recycling of aluminium packaging among teenagers: educational workshops and SMS messages via mobile phones”, by Dra. Olga Roger Loppacher. It has been supervised by Dra. Pilar Buil Gazol and Dr. Frederic Marimon Viadiu and was presented in the International University of Catalunya (UIC) in Barcelona, Spain, in July 2011. It got PhD cum laude with distinction in January 2012.

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This doctoral thesis studies the effectiveness of two communication tools in raising awareness of teenagers (aged 14 to 18) with regard to recycling aluminium packaging, namely, educational workshops and SMS messages via mobile phones. Both these tools have been chosen for several reasons. Firstly, educational workshops are a personal communication/education tool that can appeal directly to people's conscience and can be adapted perfectly to any public. Therefore, a priori, everything suggests that they should be very effective. However, this technique poses problems in terms of cost and reach, given that if one takes into account the cost per impact and the number of people that can be reached in a given period of time, some limitations become clear. This is where the other communication tool comes in: SMS messages via mobile phones (or whatsapp or other service message through cellulars). This is a relatively new technique, with a low cost and with a reach as broad as the number of mobile users, so it was thought to be of interest to verify its effectiveness and its potential use as a complement to the Workshops.





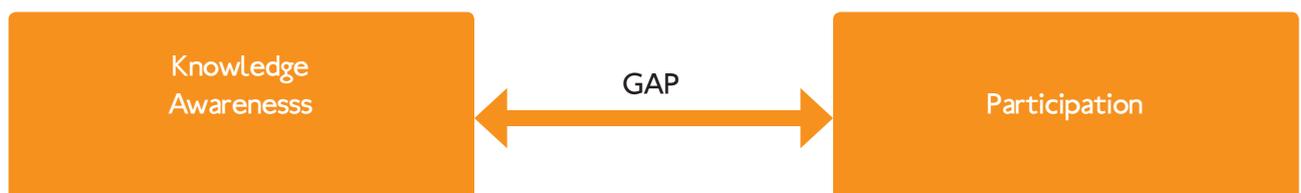
## 1.-Introduction

Packaging waste is a significant source of raw materials for industries, especially metal packaging, including aluminium containers. There are many advantages to recycling aluminium: it saves energy (manufacturing a new product with recycled aluminium requires 95% less energy compared with production from the primary mineral); it saves raw material (the mineral bauxite); the recycling process does not change the characteristics of the material, given that the product obtained has the same properties and, in addition, aluminium can be recycled indefinitely without loss of quality. For this latter reason, once it has been selected and pressed, recovered aluminium is melted and used to make new aluminium ingots, which can be used for any application desired.

Given the above facts, recycling aluminium packaging is essential, and in order to make it possible, it is necessary to have the collaboration of citizens, especially teenagers and young people, great consumers of drink cans and, also, because this population group can take recycling home and in only a few years will be adults themselves.

There are different methods of achieving the complicity of the population in recycling campaigns and one of them is educational and communication campaigns, which have been carried out in Spain for more than 15 years, with differing results. On the one hand, surveys reveal that there is knowledge and awareness of recycling among the population but that when it comes to turning it into action, this motivation does not translate into a real change in behaviour nor is the behaviour permanent. One must also take into account that surveys often reveal the desired or “politically correct” behaviour and not so much actual behaviour, which can be determined by looking at the actual volume of material treated or recycled. In this regard, according to the latest report from the European Commission on behaviours of member States with regard to waste recycling, although progress is significant, there is still a long path to cover, especially in Spain, which is on a similar level to Italy and several Eastern European countries, below the average for Europe. In Spain, levels of municipal waste recycling are very low (15% compared to the European average of 24%), deposits in landfills are high (52% compared to the average of 38%) and, on the other hand, waste generation is higher than average (with 547 kg per person, compared to the average of 513 kg per person).

Therefore, there is a veritable gap between awareness and action. This effect has been defined and studied by several authors and one of the strategies to overcome it and build a bridge between motivation and behaviour could be waste recycling communication and education campaigns. To do so, they should be perfectly designed; one of the key aspects is to choose the best suited communication tools. Up until now, it was believed that personal techniques, for instance educational Workshops or any public relations activity, could achieve the best results in cases where the aim is to raise awareness and commitment, as they involve personal communications and their effects go beyond the institutional sphere and enter into the personal, or human sphere - the relationship between people. They can help encourage attitudes that cannot be achieved with other communication tools such as advertising, which generates knowledge but has difficulty achieving new attitudes.





## 1.-Introduction

However, in less than 15 years, thanks to the creation of new technologies, new communication techniques have arisen which are now routinely used by young people, who are referred to, in this regard, as “digital natives”. We are talking of social networks such as Facebook, Twitter or Tuenti, Messenger messages and, obviously, all those that smartphones have made it possible to develop: SMS, advergaming, mobi sites, applications or apps, etc.

Mobile phone use has spread very quickly and its development as a communication tool has been unstoppable: there are constant new developments such as applications, which in no time have become the second most used service, after sending/receiving messages, both in United States and United Kingdom. And, of course, it forms part of our lives: we always carry it on us and it is always turned on, in most cases, and especially among the population group subject of this thesis (14-18 year-olds), twenty-four hours a day. It is also inconceivable not to have a personal mobile phone among the young and teenage population. Also in regard to this population group, all studies indicate that SMS messages are one of the most, or in some cases the most, commonly used applications, both in Spain and in England or the United States.

Therefore, a research study to gain insight into their response to SMS messages promoting recycling through mobile phones could provide interesting points to consider including this communication tool in campaigns aimed at young and teenage sectors of the population. In addition, SMS messaging has the great advantage of low cost per impact, so it could also act as a reminder and as a support mechanism for other communication techniques.

The results obtained in this research open the door to the use of mobile phones in environmental communication campaigns, and specifically regarding the recycling of aluminium containers aimed at teenagers. In addition, they offer guidelines to design the best messages for this population group and, especially, to avoid making mistakes which could lead to a failure of this type of communication.





## 2. RESEARCH GOALS

**RESEARCH MAIN GOAL: To measure the efficacy of two communication tools, educational Workshops and SMS messaging via mobile phones, in teenagers' awareness of and participation in recycling aluminium packaging.**

Other secondary goals were: to put together a catalogue of social communication tools , to analyse and position educational Workshops as an efficient communication tool for promoting the recycling of aluminium packaging among teenagers, to study the application of the new communication tools in environmental awareness, to measure the efficacy of SMS messages via mobile phones promoting recycling among teenagers and to study the response from the teenage public to the receipt of SMS messages promoting recycling of aluminium packaging.





### 3.- RESEARCH CARRIED OUT

In order to carry out research that provided insight into the effectiveness of Workshops on Recycling of Aluminium Packaging and SMS messages via mobile phones, two main activities were set up corresponding to two types of research: qualitative and quantitative.

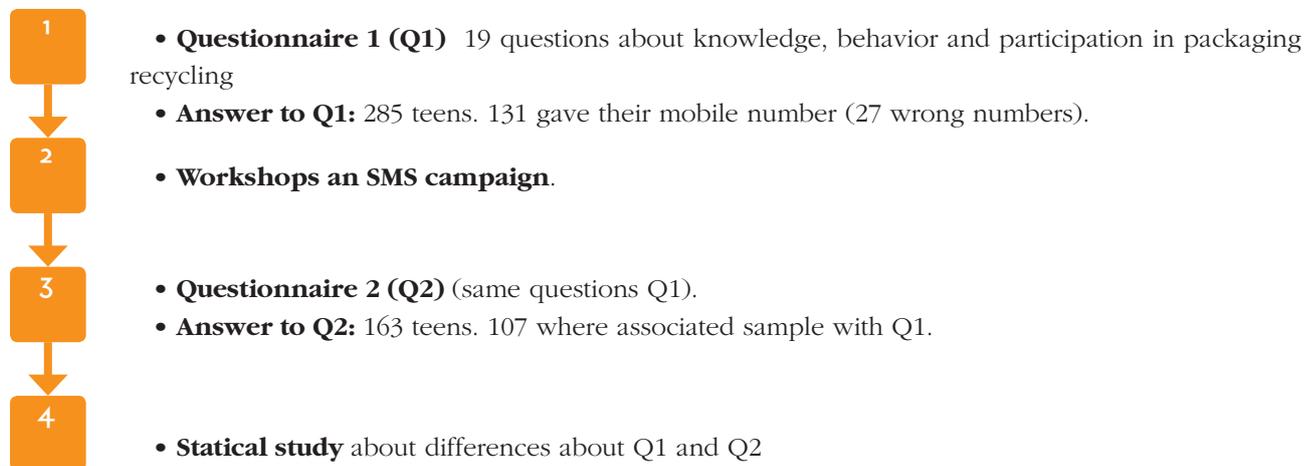
The population group included in the study were young people between the ages of 14 and 18 studying 3rd or 4th grade of ESO, baccalaureate programs (any year and any line of study) or vocational training (middle or higher grades).

**The qualitative research** allowed us to find out how young people feel towards recycling and the communication tools, hearing their arguments for their preferences and disincentives and gaining first-hand knowledge of their opinions in open and spontaneous conversations, as well as obtaining material to write the SMS used later in the quantitative research. There were three focus group sessions held in Málaga and Barcelona, striving for the attendants to be representative of the population of young people between the ages of 14 and 18.

**The statistics used in the quantitative research** has provided thoroughness to all the statements obtained in the surveys and has made it possible to gain a veritable X-ray of young people's attitudes towards recycling and their preferences in terms of social communication. The statistical analysis has also been key to verifying the efficacy of the two communication techniques analysed, both individually and as complementary tools.

The place chosen to carry out the quantitative research was the city of Málaga, where there were, at that time, 27 schools (including Primary Education, Secondary Education and Vocational Training) about to start a campaign for collecting aluminium packaging.

The quantitative research was divided into different phases:





### 3.- RESEARCH CARRIED OUT

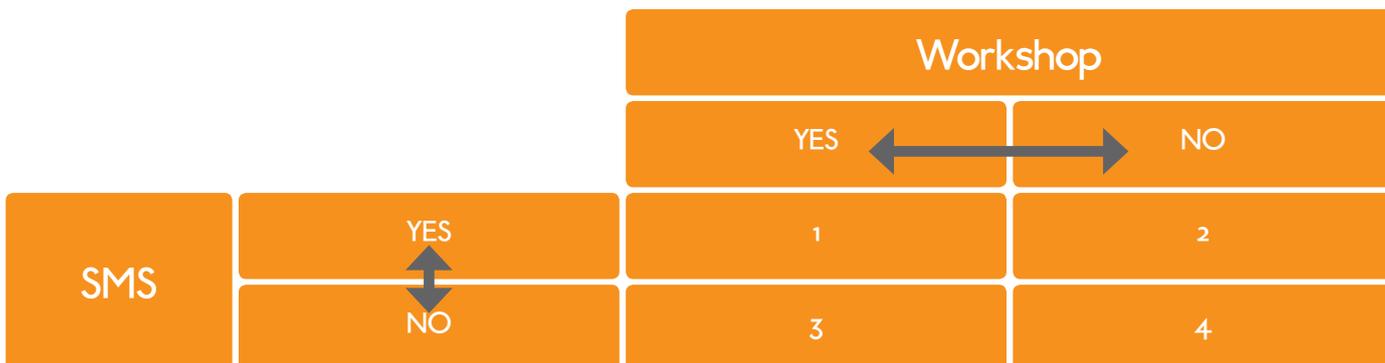
#### STATISTICAL STRATEGY

The strategy followed for the analysis of all these data was to combine three types of analysis:

- **Analysis 1:** Description of the knowledge and recycling behavior based in the study of the total Q1. It has offered a great understanding of the behavior and teens routine about recycling.

- **Analysis 2:** Differences between before and after the application of the communication tools in every question (independent sample). It has offered a great understanding about the efficiency of the communication tools but can't specify which technique has been more efficient and measure it.

- **Analysis 3:** Determination of the significant differences for the group of individuals that replied to both questionnaires (related samples) before and after the communication actions carried out. This analysis allows us to determine more clearly the degree of repercussion of the communication techniques, as well as the quantification of their effect for each of the two techniques used (workshops and SMS). Segmentation by: "Workshop" with "Not workshop"; "SMS" with "Not SMS"; finally, the 4 : "Workshop or SMS o both and Nothing".





## 4. RESULTS

### 4.1 CONCLUSIONS OF QUALITATIVE RESEARCH

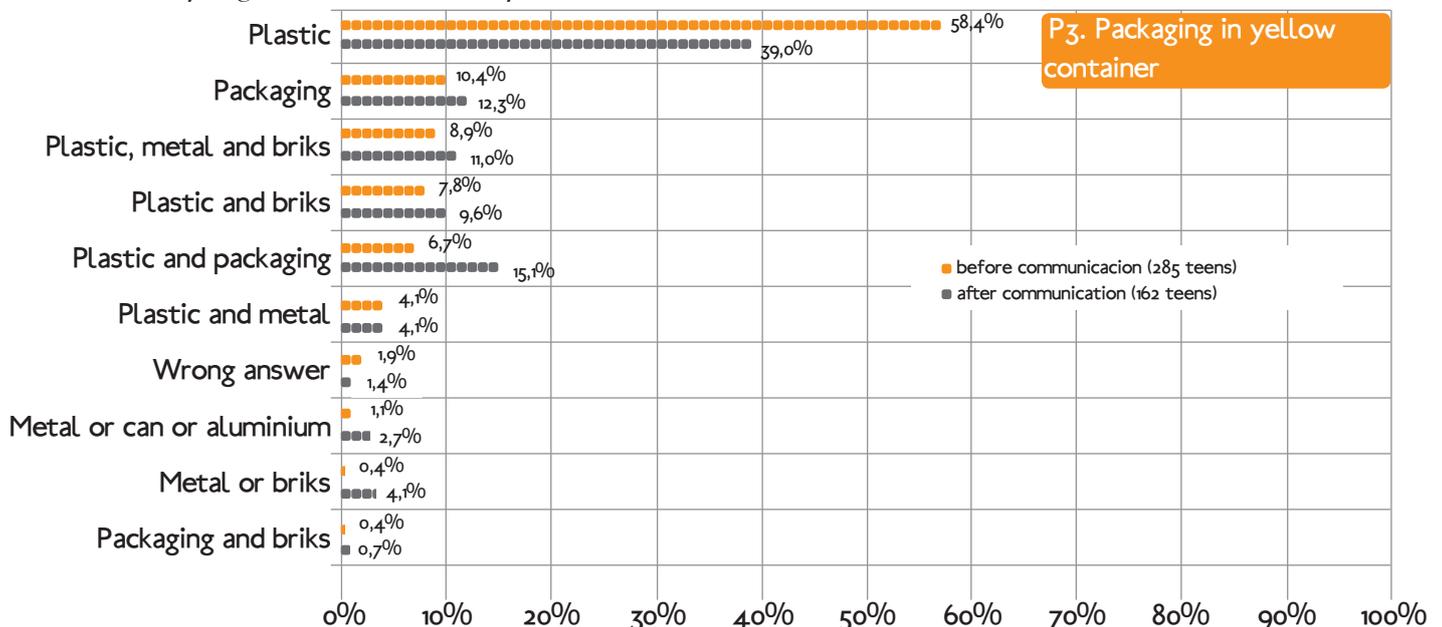
- SMS messages are one of the most widely used - in some cases the most widely used - mobile applications among the young.
- There is a unanimous rejection among young people towards mobile advertising, at least as it exists now. It is only accepted when it provides information of interest to them or presents (free calls, tunes, etc.).
- Social networks play a highly significant role in communication among young people and their preference for one or another (Facebook, Tuenti and Twitter) differs depending on the geographic areas including in the study. Today, it is impossible to conceive of their social relationships without social networks or Internet connection devices.
- There is a general lack of knowledge regarding the use of aluminium in packaging (except beverage cans) and their recycling. Beverage cans are a familiar packaging for them and they know what channels to use to recycle them, but with regard to other aluminium packaging, there is a lack of knowledge.
- The media young people prefer for recycling campaigns are TV and posters or billboards on the street or public transport (media massively used in the campaigns carried out and which they are perfectly familiar with) although the Internet (social network and email) is also deemed an important tool. The information regarding recycling carried out at schools is also deemed necessary to raise awareness, especially among the youngest.
- There is no positioning in favour or against receiving SMS messages about recycling although they are not deemed as clearly effective given the technical limitations (screen size and unloading times). Although value was given to the fact that young people carry their mobiles with them at all times and therefore messages sent to their mobile would reach their targeted audience directly. In addition, these SMS would not cause rejection if they provided information of interest to them or any kind of presents (tunes, free calls, etc.). The frequency should not be more than one per week.

### 4.2 RESULTS OF THE QUANTITATIVE RESEARCH

It is important to point out that the results offered below correspond to the three statistical analyses carried out (with no relation between them) so the figures may at times seem disparate. However the key is the trend, which coincides in all cases.

**- Communication through Educational Workshops and SMS mobile messages increases knowledge and awareness among teenagers with regard to recycling in general and aluminium packaging in particular, and engages them more.** This conclusion is supported by the following:

- After the communication, the perception of having a yellow container available to them nearby went from 80% to 88.5% (Analysis 2). With only the workshop held, the improvement was 71% (Analysis 3). Therefore we can say that in this case workshop was more effective.
- Both after the workshop and after receiving SMS (especially the latter- there was an increase of 32.3% in analysis 3-), the students perceive a more diversified use of the yellow recycling container. There is a significant increase in the percentage of students who mention “metal”, “can” and/or “aluminium” as materials to place in the yellow recycling container (+7% in analysis 2).





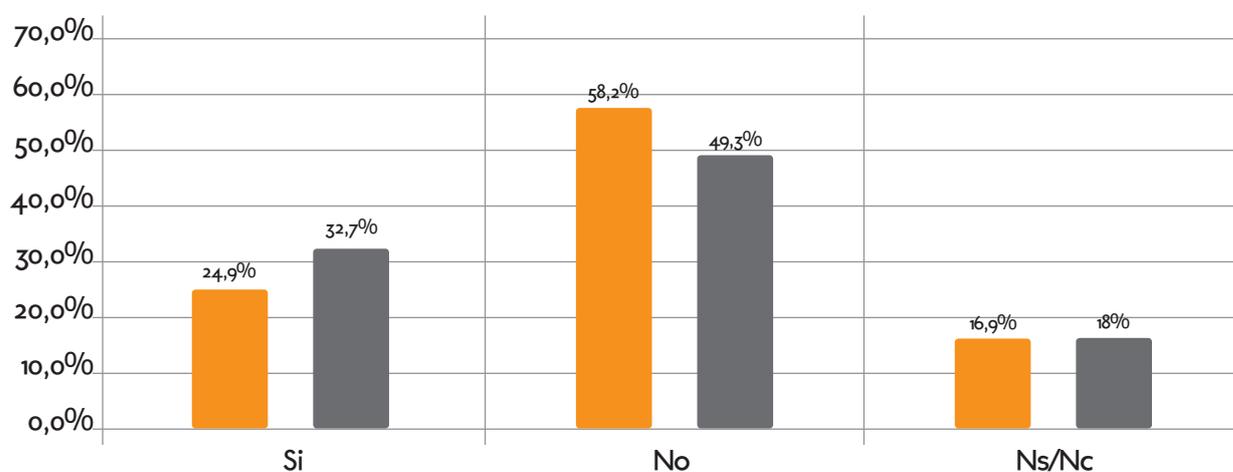
## 4. RESULTS

- After attending the Workshop and receiving the SMS messages, an efficiency of 100% in the knowledge of what container the aluminium packages should be placed in was gained; all the students who had replied incorrectly before the joint communication, replied correctly after it (analysis 3).

- After receiving some type of communication, 11.9% of students changed their answer from “no” to “yes” to the question as to whether they recycle aluminium foil (Analysis 3). In addition, after receiving some type of communication, it becomes more evident that the same materials they recycle at home (except glass), are recycled on an individual level by the teenagers, including beverage cans and aluminium packaging/foil (analysis 2).

### P10. Packaging recycled by teens: Aluminium paper? (250 teens)

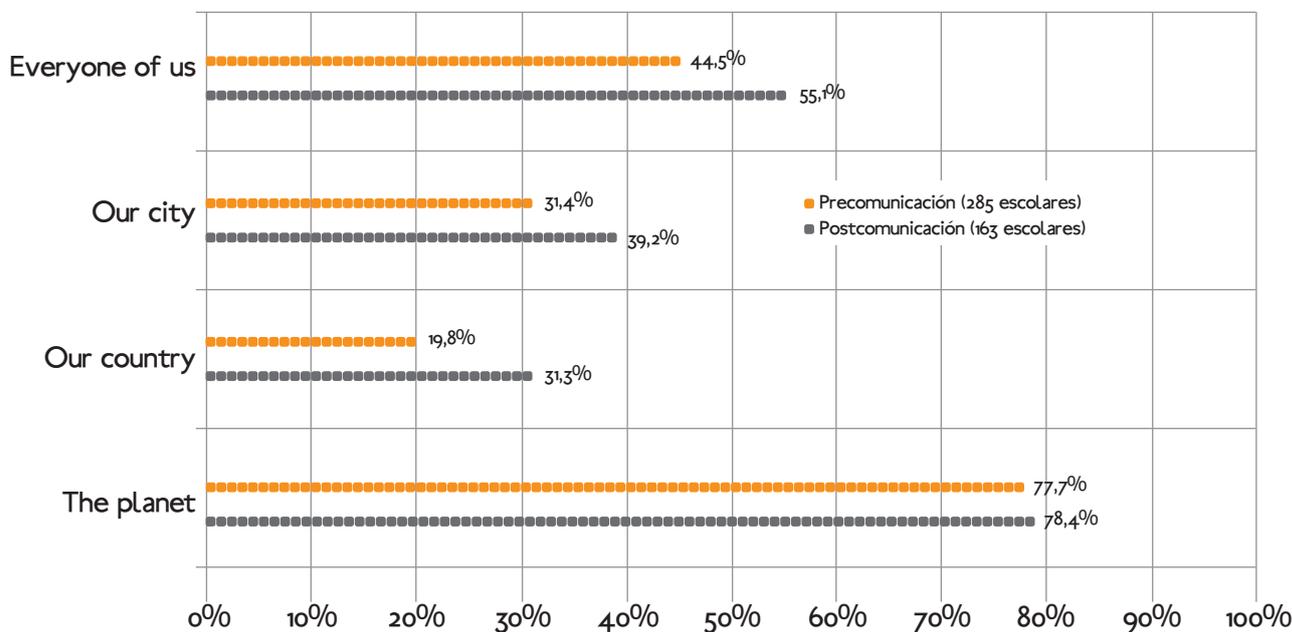
■ before communication (285 teens)  
■ after communication (163 teens)



- The communication had an impact on the teenagers thinking more seriously about the actual reason why they recycle and on the perception that their role in recycling is important.

- The communication helped them perceive recycling as a benefit closer to them (increase by 20% in the answer “us” in analysis 3 and increase by 10% in who consider closer benefit in analysis 2).

### P15. If you recycle, who gets benefits?





## 4. RESULTS

• We can conclude that a more rational awareness has been generated with regard to recycling or not recycling: following the joint communication, the percentage of students that think “Ignorance about how to recycle” is an obstacle to their participation in recycling (analysis 3) increased by 47.4%. Among teens that have not received any form of communication, increase of 31% of teens that think that recycling is “A waste of time”.

**Educational Workshops are more efficient than SMS in generating knowledge, awareness and participation in recycling of aluminium packaging but they are reinforced significantly by the support of SMS messages.** Therefore we find that personal communication techniques continue to be the most efficient for raising awareness and encouraging participation in the recycling of aluminium packaging but SMS messages can be an excellent support tool and one that serves to reinforce the messages. This conclusion is supported by the following:

- After receiving the SMS messages, there was a 32.3% increase in the knowledge among students that they can deposit “metal”, “tin” or “aluminium” in the yellow container (analysis 3).
- The improvement in the identification of where aluminium packaging should be recycled is due mainly to the Workshop, but it is complemented and reinforced by the mobile phone message communication (effectiveness rate of 100% with both techniques, with 87% prior to communication, and after the workshop only, an increase of 11.1% in analysis 3).

***Have you attended to a Workshop about aluminium packaging recycling? YES***

***Have you received SMS about recycling? YES***

***In what container aluminium packaging must go?***

Contingency Table P5_2a		After			Total
		Yellow	Green	Blue	
Before	Yellow	20	0	0	20
	Green	2	0	0	2
	Blue	1	0	0	1
Total		23	0	0	0
Result		Without change 87,0%	Better result 13,0%	Worse result 0,0%	



## 4. RESULTS

- Young people who attend a Workshop improve their perception of the importance of their “Participation in recycling without thinking of the reasons”, by 19.1%. Those who did not receive the SMS messages lower their perception (24%) of the importance they believe their participation in recycling has, so the mobile messages position themselves as a complementary technique to the Workshop to improve engagement in recycling. (Data of analysis 3).

- It has also been verified that the students who received some form of communication consider recycling as a closer benefit (country, city, personal), with an increase by 10% (Analysis 2) and 19.5% in the response “It benefits us” in analysis 3.

**- Both the educational Workshops and the SMS messages have served for the young people to know and appreciate these communication tools in the awareness of recycling.**

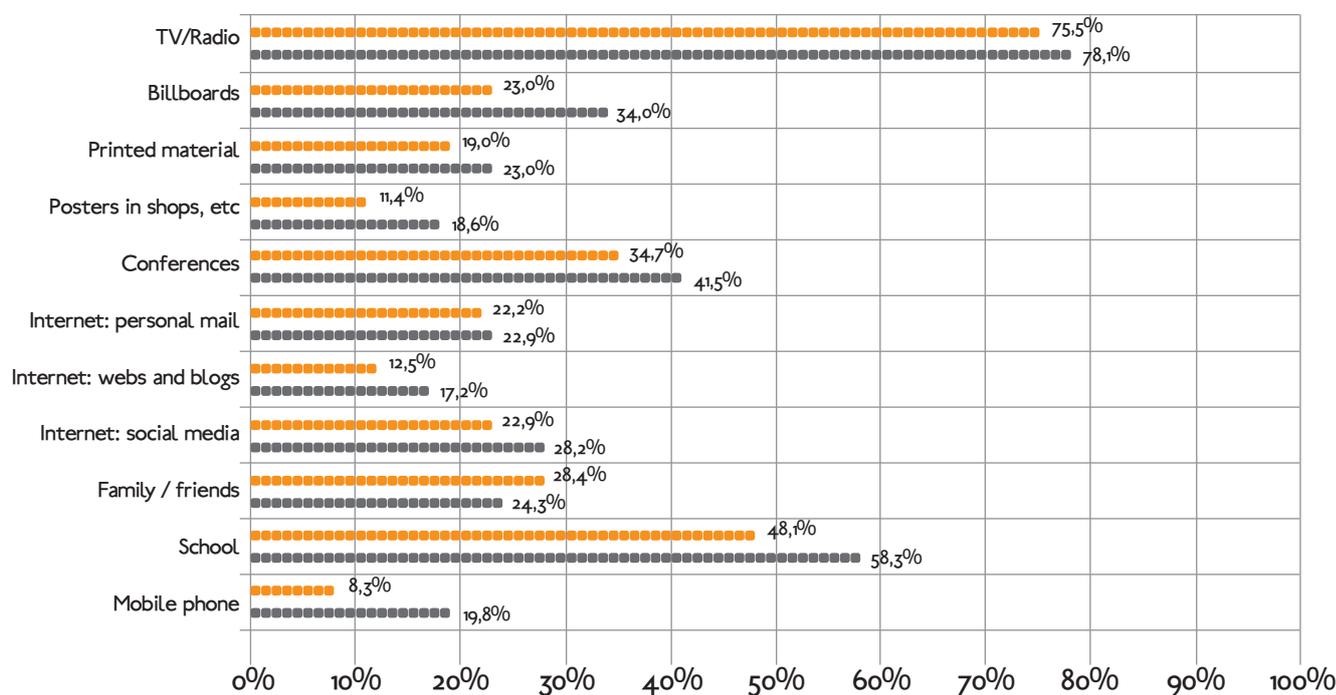
- Following the communication, there is an increase in the percentage of young people who say they have found out about recycling campaigns through conferences/talks (including Workshops and by 33.7%) and mobile phones, especially the latter, which increased by 28.7%. These increases occur both if they attended the Workshop or received the SMS and, in particular, those who had both, where the increase is 47.8% for conferences/talks and 69.6% for mobile. These results support without any doubt the communication actions carried out.

- Following the communication the opinion that mobile phones can be useful to inform citizens about recycling increases, despite it still being considered the worse means of all those mentioned (from 2.6% to 3) on a scale from 1 to 8). In addition, even the young people who did not receive SMS messages improved their opinion of this means of communication, possibly due to the ‘pass it on’ effect. Even so, mass media are still the preferred media (TV/radio getting a score of 6.54% of 8).

- Following the communication, there is an increase in the percentage of young people who wish to receive information regarding recycling through conferences/talks (from 34.7% to 41%), school (from 48.1% to 58.3%) and mobile phone (from 8.3% to 19.8%) although television and radio remain the most mentioned media, with 78%. These results show that the communication actions carried out have served for the students to appreciate the techniques used.

**P19. How teens want to get information about recycling? (People who Answer “Yes” in question 19)**

● before communication (285 teens)  
■ after communication (163 teens)





## 4. RESULTS

**- The incorrect use of SMS, as to preferred messages by the young through this medium, can generate a rejection of this communication channel.**

• This statement is supported by the observation that, in general, following the communication, there is an increase of the who say they recycle aluminium foil; but it also shows that, for those who did not receive the SMS messages, the number increases by 15.2% (analysis 3), whereas those who received it do not vary in number. This fact could indicate a possible rejection of the use of mobile phones to promote recycling. A similar conclusion was arrived at in the focus group meetings where the students stated that the SMS messages should contain information of their interest and not only slogans or advertising messages.



### Summary table of conclusions according to the statistical analysis carried out

<b>ANALYSIS 1: TOTAL SAMPLE</b>	<b>ANALYSIS 2: NON-RELATED SAMPLES Following the communication...</b>	<b>ANALYSIS 3: ASSOCIATED SAMPLES WITHOUT SEGMENTATION Following the communication...</b>	<b>ANALYSIS 3 WITH SEGMENTATION W/NO W, SMS/NO SMS, WORKSHOP and/or SMS / NO WORKSHOP and/or SMS (associated) Following the communication...</b>
The older the person, the better their knowledge of the word "recycle".	8.4% increase of students who say they have a yellow recycling container nearby.		After the Workshop there was an increase in perception of having a yellow recycling container nearby (71% increase)
Bachillerato students have a higher rate of stating the yellow container as the one to use for recycling aluminium packaging (88.2%, whereas the average was 77.7%).	There is a perception of a more diversified use of the yellow recycling container (not only for plastics) plastics -20%, packaging +2%, plastic/metal/Tetra Paks+2%, plastic/packaging +8%, metal/tin/aluminium +1.7%, metal/Tetra Paks+4%. Those citing one of the words "metal", "tin" or "aluminium" increased by 7%.	Increase in citing metal, tin, aluminium in yellow container: went from 14.5% to 21.9% (a 17.9% increase), although, taking into account those that decrease (10.5%) the real increase is 7%.	Increase by 32,3% of individuals who received SMS and in their answers to materials that can be recycled in the yellow container include "metal", "tin" or "aluminium"



4. RESULTS

Summary table of conclusions according to the statistical analysis carried out

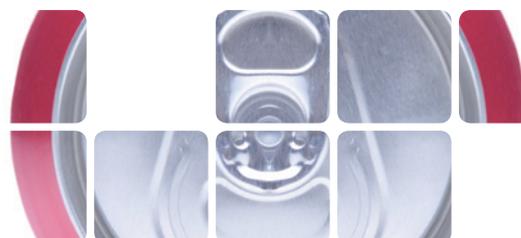
<p>Men more often chose the answer “recycling is a waste of time” as a reason for not recycling or as a difficulty to do so (the sample is small, so this data have to be taken with caution although it may be indicative).</p>	<p>-Increase by +9% of those who state that they recycle packaging/aluminium foil at home and by +8% of those who state they recycle aluminium foil. -The same materials they recycle at home are recycled by the students on an individual scale (except glass) and including drink cans and packaging/aluminium foil.</p>	<p>Increase by +11.9% of students who state they recycle aluminium foil.</p>	<p>- After the workshop they have a better knowledge of which recycling container should be used to dispose of aluminium packaging (+11.1%).  - After the workshop and the SMS, 100% knew where the aluminium packaging goes (prior to the communication, the percentage was 87%).</p>
<p>50% of students between the ages of 16 and 18 have found out about recycling campaigns on printed matter (30% for other ages).</p>	<p>They acknowledge that they recycle but up to now they had not thought about the reasons for recycling (+8%).</p>	<p>They acknowledge that they recycle but up to now they had not thought about the reasons for recycling (+17.6%).</p>	<p>Those receiving the workshop recycle but had not thought of the reasons (+19.1%), like those who received SMS (+23.8%). Among those who received both forms of communication, the increase of the same reason was 25%.</p>
<p>15% of students state that at home no materials are recycled, whereas 13% state that all materials are recycled.</p>	<p>Improvement of perception of beneficiary of recycling, becomes closer. (+ 10%).</p>	<p>Recycling benefits each one of us (+19.5%).</p>	
<p>79% of students value the importance of recycling, giving it 7 to 10 on a scale of 1-10. Average valuation: 7.7</p>			<p>Those that did not receive SMS had a lower valuation of the importance of recycling -24%. Those attending the workshop improved by +19.1%.</p>
<p>32% of students recycle daily, 26% weekly, 18% at least once a month and 12% less than once a month or never.</p>			<p>After the joint communication, +47.4% increase the importance of the concept “lack of knowledge as to how to recycle”.  Those who did not receive any communication, +31% consider recycling to be a waste of time.</p>
<p>Materials recycled by young people: Tetra Paks (49.4%), drink cans (44.8%), aluminium foil (24.8%), aluminium packaging (30.1). Glass (67.2%) and paper/cardboard (80.4%).</p>		<p>Increase of number of students who state they recycle aluminium foil (+11.9%).</p>	<p>Of those who did not receive SMS messages, 15.2% stated that they recycle aluminium after the communication, whereas before they said they did not (this data may be affected by those who did the Workshop, but it has not been possible to confirm this). It could also indicate a possible rejection to the SMS received.</p>



## 4. RESULTS

### Summary table of conclusions according to the statistical analysis carried out

<p>Aspects that hinder recycling: lack of space, lack of knowledge of the advantages it implies and lack of knowledge as to how to recycle.</p>			
<p>Main media where they have found out about recycling campaigns: TV/radio and school (60% to 70%), conferences, talks, leaflets and other printed material, family/friends, billboards and posters (30% to 43%), Internet -email and social networks-(15%) and webs/blogs and mobile phones (less than 5%).</p>	<p>Increase in number of those stating billboards, conferences/talks (+20%), school (+7%) and mobile phone (+22%). Almost all the significant increases (except the billboards) are associated with the communication carried out.</p>	<p>They state that they have found out about recycling campaigns through conferences/talks (+33.7%) and mobile phone (+28.7%).</p>	<p><b>They have found out about campaigns (after Workshop) through:</b> billboards (+28%), conferences/talks (+30.8%) and mobile phone (+30.2%).  <b>No workshop:</b> conferences (+38.2%) and mobile phone (+26.5%).  <b>- They have found out about recycling campaigns (after SMS messages) through:</b> mobile phone (+51.1%), conferences/talks (+44.1%).  <b>- Following the joint communication:</b> +47.8% conferences/talks, +69.6% mobile.</p>
	<p>The following are considered less important for society: TV/radio, personal email, family. More important: mobile, conferences/talks and social networks. (Almost all the most significant increases are associated with the communication carried out).</p>	<p>They believe the recycling communication aimed at society in general through TV/radio and family/classmates to be less important and through mobile phone more important.</p>	<p>Following the workshop, they consider mobile phones as adequate for transmitting info regarding recycling to society +26.7%.  <b>NO SMS:</b> +25% consider that mobile phones are adequate for transmitting info to society ('pass it on' effect?).</p>
<p>Want to receive recycling info through: TV/radio (78%), school (58.3%), conferences/talks (34.7%), billboards (23%), family/school friends (28.4%), social networks (22.9%), personal email (22.2%), posters (11.4%), mobile phone (8.3%)</p>	<p>Want to receive recycling info through: TV/radio (+3%), school (+10%), conferences/talks (+7%), billboards (+11%), family/school friends (-4%), social networks (+6%), personal email (+0.7%), mobile phone (+11.5%), and posters (+7%) (Almost all the most significant increases are associated with the communication carried out).</p>	<p>Want to receive recycling info: +11.5% Mobile phone</p>	<p>Want to receive recycling info: mobile phone (+26.7% after Workshop). Those who have received SMS have changed their preference with regard to information by personal email (36.4% to 9.1%).</p>





## 5.- FINAL CONCLUSIONS



**The main conclusion from this research is that the communication carried out with educational Workshops and SMS messages has been efficient** in achieving three key points for participation of young people between the ages of 14 and 18 in campaigns for recycling aluminium packaging: **acquisition of knowledge regarding why, where and how to recycle these packagings; awareness-raising or motivation regarding the benefits of recycling; and, lastly, going into action, that is, taking part in recycling.**

The statistical research has also looked at the differences between the **individual efficacy of each of the two communication techniques for achieving participation of young people in recycling. Thus, we have seen that the educational Workshops obtain better results when it comes to generating knowledge, awareness and participation in recycling, but their work is reinforced and extended with the sending of SMS messages.** This is an important conclusion, as it is possible to use a low cost, large scope technique such as SMS messaging as a complement to a personal communication technique which has the disadvantage of having a high impact cost and a far lower scope.

**Regarding knowledge acquisition,** the quantitative research has allowed us to see that after attending a workshop and receiving the SMS messages, 100% of the young people answered correctly to the question as to where the aluminium packaging should be deposited. But with the workshop only, there is a significant improvement in the knowledge of where to deposit aluminium packaging for recycling, though not total.

Following the communication, the teenagers perceived a more diversified use of the yellow recycling container: in the first questionnaire 58.4% thought it was only for plastics and this figure dropped to 39% in the second; likewise there was an increase in the number of young people who know that it is for packaging or who cite “metal”, “tin” and/or “aluminium” as materials to deposit in the yellow container (prior to the communication, 14.5% of students had cited one of the previous words whereas after the communication the percentage reached 21.9%).

This increase occurred especially in those who received the SMS messages (32.3%), therefore also here the mobile phone messages also position themselves as an efficient and complementary technique.

**With regard to the increase in awareness and habit** regarding aluminium packaging recycling, it is supported, also in the quantitative research, by several factors. First, by a higher perception of having a yellow recycling container nearby after the workshop (71% increase); second, by an increase in the perception of recycling as a benefit that is closer; thirdly, by an increase in the importance given to the fact “lack of knowledge regarding how to recycle” as a possible hindrance to participate in recycling (increase of 47.4% after receiving the joint communication); and, lastly, by the 25% increase of young people who recognise that before then they had never thought about the reason for recycling, also after the joint communication (appeals to conscience).



## 5.- FINAL CONCLUSIONS

The workshop has been very effective in increasing the perception of having a yellow recycling container nearby, as this increases considerably after attending it: 71% more teenagers state they have one available nearby after this communication activity, as mentioned above. Likewise, also after the workshop, young people have better knowledge of what recycling container the aluminium packaging goes in, with an increase of 11.1%, as mentioned above. The workshop has also been very important in the valuation that young people make of their participation in recycling without thinking of the reasons, that is, they have come to recycle as a habit (with an increase among the workshop attendants of 19.1%).

The SMS messaging, individually, has also shown to be effective in increasing the awareness of students: among those who did not receive messages, the value given to their participation in recycling decrease 24% . Therefore, also here the SMS messages posit themselves as a valuable tool of communication, complementary to the workshops. In the face of these facts, we can confirm that the communication has served to generate a more rational awareness, for young people to think more rigorously about the real reasons why they recycle and to maintain the perception that their individual participation in recycling is important. Likewise, it can be considered that the two techniques have also served to partly overcome the free rider effect (giving little value to individual participation if it is not accompanied by a global action of the population, perceived in the qualitative research).

Lastly, with regard to considering whether recycling provides benefits close to them, the complementariness of SMS messaging has also been verified. After receiving some type of communication, the perception of a closer benefit increases (increase of 10.6% in “us” as beneficiaries, 7.8% for “city” and 11.5% for “country” and none for “planet”). The students who did not attend any workshops also increased this perception, although only on a personal level, that is, they gave more “us” answers to who benefited from recycling. Therefore, we can say that the workshop helped to raise awareness of the benefit obtained by the community through recycling and not only on a personal level.

**With regard to action, the actual participation of the students in recycling aluminium also increased:** after receiving some type of communication, 11.9% of students changed their answer from “no” to “yes” to the question as to whether they recycled aluminium foil. In addition, the increase of those who answered in the second questionnaire that at home they recycled aluminium packaging and aluminium foil was 9%. Also, following the communication, it has been more evident that the same materials recycled at home (except for glass) are recycled individually by the students, including beverage cans and aluminium packaging/foil (high use outside the home, in particular cans and foil).

**Another interesting conclusion of the research is the verification that both the workshops and the SMS messages have served for young people to know and value these communication tools** as transmitters of the message regarding recycling, both for society and for them in particular. When asked how they found out about recycling campaigns in their city, the answer “conferences/talks” (which would include workshops) increased 20% after receiving some communication, as did the answer “mobile phone”, which increased remarkably from 2.4% in the first questionnaire to 25% in the second. The section “school” increased by 7 points. These responses also support the efficacy of the communication actions carried out.

After the communication, there has been a slight growth in the percentage of young people who believe that mobiles can be useful to disseminate messages about recycling to society, but more especially there has been a significant increase among teenagers who state that they wish to receive information about recycling via their mobiles, rising from 8.3% to 19.8%. After the workshop there has also been an increase in the perception that mobiles are adequate to transmit information about recycling to society (there has been an increase of 30.2%). Paradoxically, among young people that did not receive SMS messages directly, there is an improvement in their perception of the mobile phone as an environmental communication tool for society, which could have meant that there was a possible ‘pass it on’ effect or interest generated by the receipt of SMS by their friends. The increase in young people who have chosen mobile phones as an effective



## 5.- FINAL CONCLUSIONS

technique for society without having received SMS was of 25%.

In addition, there is also evidence that this technique could be rejected if the SMS did not adjust to the desires of teenagers. In the qualitative research carried out, attention was paid to the unanimous hostility against mobile advertising, for not providing anything interesting for them, such as for instance exclusive information, tunes, free credit, etc. It was also confirmed that messages about recycling would be welcomed provided they included information of interest to them or a certain extra gift, and, in addition, that the frequency of these messages did not exceed one per week.

The quantitative research indicates that this rejection effect might have existed: although after the joint communication received, 11.9% more young people stated they recycled aluminium foil, those that didn't receive the SMS increased the recycling of this material by 15.2% whereas, among those who did receive it, there were no differences noted in their answers. Judging by these data, there may have been a rejection effect among those who received an SMS, although it has only been perceived in the question regarding this matter. Thinking of the possible causes behind this possible rejection which may have led to considering the SMS messages as interference (though this should be further studied), they may be related to the frequency of SMS sent out (two per week) or the fact that no added gifts were offered.

**Lastly, this research has also served to find out about the opinion of teenagers regarding environmental communication techniques**, as transmitters of the message to society both generally and specifically, and herein lies the biggest relevance, to their sector of population. The quantitative research revealed that mass media are still their favourite (despite the increase in their appreciation of the techniques studied and social media).

Young people gave the following evaluation of the different communication techniques they were asked about : 78% television and radio, 58.3% chose school (similar to workshops), 41.5% stated talks and conferences (which can also be considered similar to workshops), 34% opted for advertising billboards, 28,2% chose social networks, 23% stated pamphlets and other printed material, 22.9% chose personal email, 19.8% opted for the mobile phone, 18% for posters in establishments and receptions and 17.2% chose websites and blogs. The qualitative research showed that their favourite media were TV and street advertising, though the Internet (social media and email) were also high on the list. As to social media, we should point out that they were described as a very important means of communication (one could almost say essential) among today's youth and that their preferences for one or another (Facebook, Tuenti and/or Twitter) varied depending on the geographic area.

Our final conclusion is that the research we carried out provided valuable information regarding the efficiency of educational workshops and SMS in communication campaigns regarding the recycling of aluminium packaging aimed at teenagers, which will help design more efficient campaigns to achieve the participation of young people.