Effective Interventions on littering behaviour of youngsters

What are the ingrediënts?

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PREFACE

Provided with the challenging task of making a checklist, guidelines and a monitoring tool aimed at a more effective design and evaluation of interventions that address littering behaviour amongst youngsters, we have experienced weeks full of laughter, discussion, difficulties and corporation. The end results are products that have been constructed by combining all our personal qualities, which makes the end products extent the abilities of one person. Therefore, we proudly present the theoretical underpinnings of these products in this report.

However, firstly we want to elaborate more on some of our experiences during these seven weeks. During the process we came to the conclusion that the questions we formulated in our proposal were not adequate for the construction of the desired products. We therefore needed to change our proposed direction. This resulted in some struggle as some aspects of which path to take became unclear. However, after we agreed on the direction to take, we were all more dedicated than ever and the chosen direction turned out great.

Also, our first time of approaching a project as consultants, instead of academic researchers, was accompanied by some struggles and unease. How should we present our findings? Can we really give our own interpretation of this matter? Can we use this non-academic report as a source of information? However, the unease about this issue resolved into us firmly believing in everything we state, as we were forced to critically reflect on our statements.

We are left with expressing our gratitude towards the many people who helped us during our process of making this report and products. We firstly want to express our gratitude to our first commissioner Irene Gosselink from the WUR Science Shop for her empathetic way in guiding us through the first steps of this project and our extended commissioners Sjoerd Kaarsemaker and Tessa de Been from the NME for showing us, and passing on, their enthusiasm and heart for the case, as well as helping us greatly content-wise. We definitely changed our own littering behaviour for the better.

We also want to thank our 'assigned expert' Bob Mulder, for helping us with the content and theoretical structure of our report, as well as getting us on the road again after a few experienced struggles.

Also, we thank the many experts on behavioural change that have given us their time and opinions about the subject matter, which we value greatly.

Lastly, we want to thank our coach Karlijn Engelaar for helping us recognize our qualities and pitfalls, and with helping us with our personal struggles regarding this project.

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Problem

Littering in general has become a major problem for society. In the Netherlands, youngsters (ages 12-18) are amongst the biggest litterers. However, making effective interventions that target youngsters' littering behaviour has proven to be difficult as it is not yet known what the most important determinants of youngsters littering behaviour are and with what strategies these determinants could best be targeted.

Purpose

The aim of this report, commissioned by Wageningen University and Research Centre (WUR) Science Shop and extendedly commissioned by Natuur en Mileu Educatie (NME), is to make salient the most important determinants in youngsters littering behaviour and to provide the reader with strategies how these determinants can be best targeted. To answer this we have set the following research questions:

Main question: What are effective ingredients for interventions aimed at the reduction of littering behaviour amongst youngsters (ages 12-18)?

a. What are the theory- and evidence-based determinants of littering behaviour amongst youngsters (aged 12-18)?

b. What are the effective strategies used in existing interventions, and in what behavioural terms (i.e. the targeted behaviours) is effectiveness formulated?

c. What are the most important theory- and evidence-based determinants (and related mechanisms) that can be targeted to increase the effect of interventions?

d. How are these effective theory- and evidence-based methods translated into practical strategies in the littering literature?

The findings presented in this report have been further used as a basis for the creation of tools to design and monitor interventions that can lead to the reduction of littering behaviour amongst youngsters (12-18 years old) in the Netherlands. These tools consist of a monitoring tool as well as checklist with an appendant guideline.

Procedure

Based on an up-to-date literature review on the determinants of littering behaviour and strategies to tackle them, in combination with nine expert interviews, recommendations for designing interventions aimed at the reduction of youngsters littering behaviour were formulated to increase the effectiveness of these interventions.

Advice

The following advice can be used to increase the effectiveness of interventions aimed at the reduction of littering behaviour amongst youngsters:

1. *Use the youngsters social surroundings*
   - Target peer groups instead of individuals
   - Generate the norm not to litter in groups and make it visible
   - Establish group commitment
   - Make use of the influence of an existing leader in a group

2. *Attract youngsters attention*
   - Make use of clear, short messages
   - Connect to youngsters life views; connect to their interests and tap into their enthusiasm
   - Make use of bright colours, images of text, prompting and routing
   - Use communication channels with the greatest chance of exposure and effect (internet, social media)
   - Use a combination of prompts (visual/verbal) instead of just one type of prompt

3. *Target youngsters' beliefs about the effects of littering*
   - Make youngsters aware of the effects of littering on the environment
   - Expose youngsters frequently to the intervention in their natural surroundings
   - Provide outdoor environmental education to create a more positive attitude towards the environment
   - Provide information or visualize the bio-degradability of litter

4. *Reward proper waste disposal behaviour*
   - Reward youngsters performing the desired behaviour. Rewards can be either monetary or social non-monetary incentives
   - Lotteries and competitions seem promising

5. *Facilitate proper waste disposal behaviour instead of aiming to change youngsters*
   - Make sure that enough disposal possibilities (empty bins) are available
   - Avoid accumulation of litter; litter leads to more litter.
   - Keep away smells from areas where litter easily accumulates
   - Make sure bins and their surroundings are clean and easy accessible

This last advice underscores the importance of collaborating with other stakeholders (e.g. municipalities) to ensure that these conditions for youngsters' behavioural change are present. However, targeting these conditions cannot be done by intervention makers themselves that this report has been written for.

Limitations and conclusion

Youngsters are a unique target group because they can reveal behaviour that is described as impulsive, lazy or self-focused. These characteristics are often hard to change in a short time. Therefore, we stress that expectations about changing youngsters' littering behaviour should not be set to high. We recommend future research to explore the perhaps positive effect of targeting specific groups of youngsters and making customized interventions to address their littering behaviour.

1. INTRODUCTION

1.1 INTRODUCTION TO THE PROBLEM

Litter on the sidewalk is present in many parts of the world. In many Western countries litter is perceived as both an environmental and economic concern, as litter is associated with harmful effects for the environment and high costs. Moreover, polluted areas also cause a lower appreciation of people's direct physical environments (Budruk & Manning, 2003). In the Netherlands, the annual litter removal amounts to an average of €250 million per year (Hoppe, Bressers, De Bruijn, & Franco -Garcia, 2013). Thus, littering can be seen as a concern for the environment, but also as an economic and societal problem. Effective interventions are needed in order to address this issue.

When developing interventions on littering it is important to understand that behaviour related to littering cannot be seen as an isolated form of behaviour; it takes place in a physical and social context. Individual changes can contribute to a more sustainable lifestyle, but progress depends upon support from changes made by the whole society. This makes behaviour change a complex process, because it means that interventions should attempt to reach a large target (Belz & Peattie, 2009).

In the Netherlands, youngsters are known to be an important target group for the changing of littering behaviour because they are amongst the biggest polluters (Müller, 2011). The behaviour of this group can be seen as unique since they are in a transition between childhood to adulthood. Therefore, we perceive the implementation of interventions on littering behaviour of this specific target group as challenging. Different intervention strategies have been implemented in order to intervene in and change littering behaviour of youngsters. Nevertheless, these strategies have not yet been proven to perform a sustainable behavioural change. Taking this into account, designing interventions that can effectively change youngsters' behaviour are crucial. In this study, we will explore the effective components that lead to a change in youngster's littering behaviour and mention strategies that can be used in order to target these components.

1.2 NATUUR EN MILIEU EDUCATIE

Regional activities all over the world have been created to address the problem of littering (European Commission, 2015). One of the sectors in the Netherlands which is addressing the littering problem is Natuur en Milieu Educatie (NME, Nature and Environment Education). The NME has a widespread network in the Netherlands, which includes companies, policy makers, volunteers and citizens to educate and communicate about nature and environment (IVN, n.d.). The littering work group of the NME network, a cooperation of 24 NME centres, is looking for methods to reduce littering by addressing different target groups within the Dutch society in order to reduce littering (Utrecht Natuurlijk, n.d.). Youngsters are an important target group because they are amongst the biggest polluters (Müller, 2011). A reduction in littering behaviour by this group may stimulate the correct disposal of a significant amount of waste, and can therefore contribute to a more litter-free environment. Until now, the work group's efforts are mostly directed towards education on primary schools. Elements to raise awareness amongst the primary school children are incorporated in all

interventions provided by the work group. Some interventions incorporate cleaning and separating activities. (Ibid.).

1.3 PURPOSE OF THE PROJECT

The purpose of this project was to create tools based on theory and evidence, to design and monitor interventions that can lead to the reduction of littering behaviour amongst youngsters (ages 12 to 18) in the Netherlands. These tools are a checklist and guidelines to enhance the effectiveness of new interventions, as well as a monitoring tool to evaluate the effect of interventions. To reach this purpose, the main research question for investigation has been formulated as:

What are effective ingredients for interventions aimed at the reduction of littering behaviour amongst youngsters (ages 12 to 18)?

To answer this main question, the following sub-research questions have been formulated:

a. *What are the theory- and evidence-based determinants of littering behaviour amongst youngsters (aged 12-18)?*
b. *What are the effective strategies used in existing interventions, and in what behavioural terms (i.e. the targeted behaviours) is effectiveness formulated?*
c. *What are the most important theory- and evidence-based determinants (and related mechanisms) that can be targeted to increase the effect of interventions?*
d. *How are these effective theory- and evidence-based methods translated into practical strategies in the littering literature?*

1.4. METHODOLOGY

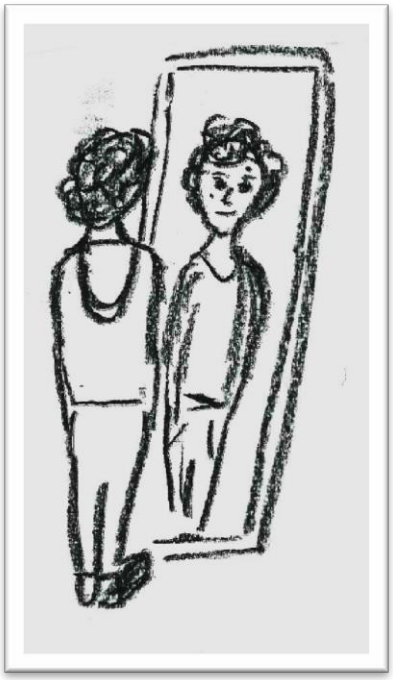
In order to address the above research questions and to create a checklist, guidelines as well as a monitoring tool, we conducted a thorough and structural literature review. In this literature review, we looked into theories that explain behaviour, specific determinants of littering, and relevant and evaluated interventions. To strengthen our arguments, we conducted nine expert interviews to ask for advice specifically on interventions targeted at youngsters. These experts are Nynke Sminia, nature and environmental researcher and consultant at 'Zaans Natuur en Milieu Centrum'; Tessa de Been, NME-consultant at 'Het Groene Wiel'; Tessa Lansu, assistant professor Developmental and Psychogerontology at Radboud University Nijmegen; Maarten Jacobs, environmental psychologist at Wageningen University; Toon Cillessen, chair of Developmental Psychology at Radboud University Nijmegen; Jeptha Peijs, researcher and game designer at 'Ijsfontein', a company that designs and develops playful learning materials; Lotte Penninx, child and youth psychologist; Marie-Anne Lamers, child and youth psychologist; and Henk Staats, professor of environmental behaviour at Leiden University. We incorporated our findings into a determinant delineation matrix (Bartholomew, Parcel, Kok, & Gottlieb, 2006), which addresses the importance and changeability of found determinants.

In this report, we firstly introduce a fictional case in order to visualize the following theory, determinants and interventions. Next, we address the determinants of littering behaviour of youngsters and effective strategies to target these determinants we have found from the literature review. A summary of recommendations can be found in the blue boxes throughout the report. In

the final part there is a discussion of our findings and we end the report with a conclusion and advice section.

1. 5 The Case of Jasper

Meet Jasper



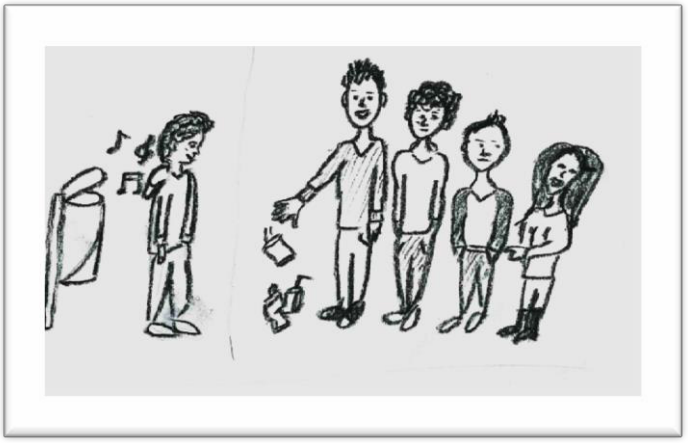
Jasper is a fourteen-year-old student in high school. He is living with his parents and younger sister in Amersfoort, a town in the Netherlands. He goes to school every day and in his leisure time he likes to meet up with his friends from school. Twice a week he plays football at the sports club near his house. He is a spontaneous, enthusiastic boy who likes to make jokes and hang out with his friends.

During breaks in school all students are allowed to go off the schoolyard. Jasper and his friend like to go to the supermarket that is only a 5 minute walk from there. He often buys candy from the monthly allowance he gets from his parents. On their way back to school, they tease one another by throwing candy wraps at each other. Some of these wraps end on the sidewalk or in the bushes. When the box where these candies came in is empty, they throw it in the only bin that is located at this route.

During his life, Jasper gained knowledge about the world and the natural environment. The classes he followed in secondary school contributed to this. Geography lessons taught him about the effects of human life on soil and nature. Physics taught him about different materials and how they interact with each other. Biology taught him more about living creatures in nature and how plants grow and nature evolves. Within this course he also learned about the lifecycle of different materials and products.

Last year, the municipality of Amersfoort has started a campaign to make the residents more aware of their disposal behaviour and to prevent them from littering. They actively communicated slogans like 'keep the environment clean' and held some litter-collection actions together with the residents of neighbourhoods (B&W Gemeente Amersfoort, 2014). Jasper did not join these collective actions, despite the efforts of his parents to involve him to join the litter collection in the neighbourhood he lives in. Altogether, his education, the municipality campaign and the values of his parents provided him with a certain knowledge level on positive and negative aspects of his littering behaviour that can affect his surroundings.

However, Jasper is not fully interested in the effects of his behaviour on the environment. He prefers to hang out with his friends and play games. When his parents ask him to do something he feels reluctant and prefers to do what he wants, or what he thinks what looks cool. Jasper considers himself to be old enough to decide on his own life. He does not need his parents to tell him what to do.



Jasper does value nature, but not in a way that he actively thinks about preserving nature. He likes to be outdoors a lot, playing football games and building treehouses.

Jaspers' somewhat capricious behaviour can be explained by the fact that his brains are in a state of cognitive developmental transition. He is not a child anymore but certainly also not an adult yet. It is known that the brain of youngsters and especially (social) cognition is still developing. This has an influence on th e behaviour of youngsters which can lead to letting them believe that they are fully able to grasp and understand things the way adults do (Blakemore and Choudhury, 2006). However, sometimes Jasper does take on responsibility for the effects of his actions as an adult would. He finds himself in a field of tension. Sometimes he thinks that he knows what is best, but sometimes he also sees that his behaviour can have negative consequences for other people. Thus, his behaviour can relate to either a youngster-view or an adult-view (Van de Water & Velt, 2008; SenterNovem & Stichting Nederland Schoon, 2009). Blakemore and Choudhury (2006) mention about this phase that the *"transition from childhood to adulthood is … characterised by dramatic changes in identity, self-consciousness and cognitive flexibility*" (p.296).

This case provides insight in the target group of this report: youngsters. It shows that a youngster lives with certain norms, values and interests. His life is influenced by his social environment; friends, family, municipality, sports club, etc. This illustrates that it is not possible to look at a youngster without considering his environment. People and their environment interact continuously. The report is written from this perspective. After each main section of littering determinants we refer back to the case of Jasper by taking into account his norms, values and environment to make the behaviour of youngsters more explicit.

2. Determinants of Youngsters' Littering Behaviour

2.2. Determinants and their manipulation of littering behaviour amongst youngsters

2.2.1. Theory of Planned behaviour

The Theory of Planned Behaviour (TPB) (Ajzen, 1991) outlines that somebody's attitude toward behaviour, his or her subjective norms, and his or her perceived behavioural control, together form an individual's behavioural intention and the actual behaviour (see Figure 1). Intention is influenced by the attitude of an individual towards performing the behaviour, the subjective norm that surrounds the behaviour and also by the control an individual thinks he has over performing that behaviour. It is assumed that the stronger the intentions to perform certain behaviour, the more likely the actual behaviour is to occur.

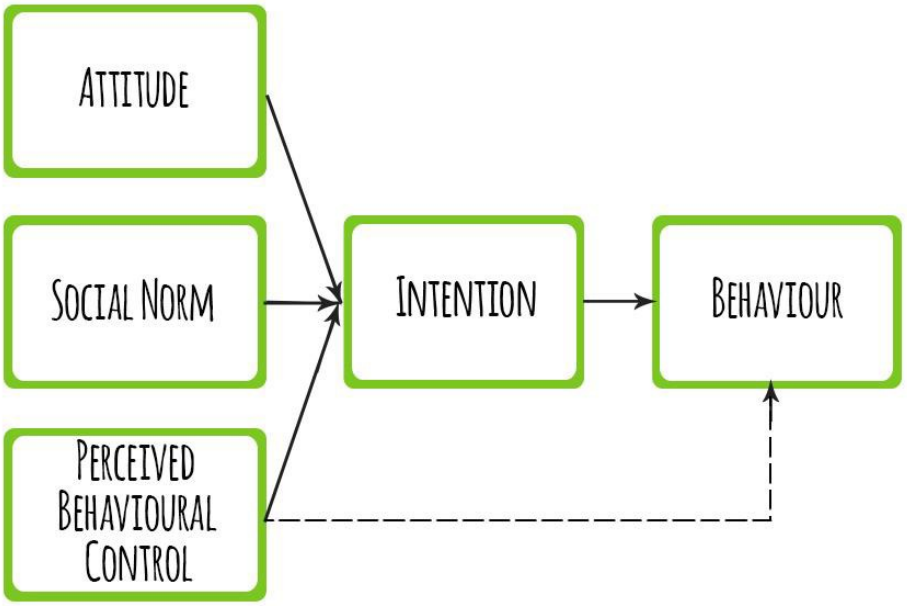


FIGURE 1: ILLUSTRATION OF THE THEORY OF PLANNED BEHAVIOUR

In the coming chapter we will elaborate on the different aspects of the TPB. Furthermore, we will position theory- and evidence-based determinants of littering behaviour within this model to get insight in the littering behaviour of youngsters. These determinants will be connected to practical evidence from existing interventions that address littering. These are marked as the effective ingredients which can be used as a guide to build an effective intervention that addresses littering behaviour. The outcomes from the evaluated interventions are placed within the model illustrated in Figure 1 as well. Below, an overview can be found of the different determinants that will be discussed.

FIGURE 2: DETERMINANTS OF LITTERING BEHAVIOUR

2.2.2. ATTITUDE

The attitude towards behaviour can be defined as a positive or negative evaluation of performing a particular behaviour. This attitude is determined by the set of so called behavioural beliefs, which is what an individual's believes to be the consequences of behaviour. This belief is based on the subjective chance that a given outcome is produced by the behaviour, and a weighing of this

outcome. Attitudes are either positive or negative. People automatically acquire their beliefs about something, by associating it with certain objects, characteristics or events. Therefore, people form favourable attitudes towards behaviour they believe to have large desirable consequences and unfavourable attitudes toward behaviours they associate with undesirable consequences. (Ajzen, 1991). Thus, according to the TPB, people form an attitude by quickly analysing the costs and benefits of performing certain behaviour.

Below, the determinants found in the literature study and expert interviews that influence the attitude a youngster obtains regarding litter are described. We extend per determinant on the interventions that we considered relevant to influence it, and by extracting its effective ingredients, give recommendations for future interventions.

Perceived effect of littering

Firstly, a determinant of littering behaviour is the belief one has of the effect of littering. Intervention designers can address this determinant by providing education on pro-environmental behaviour. Empirical evidence has been found about the effectiveness of interventions that target the beliefs about the effect of littering. This literature indicates that education can increase pro-environmental behaviour in the population in general (Bolderdijk, Gorsira, Keizer & Steg, 2013; Dwyer, Leeming, Cobern, Porter & Jackson, 1993). Colberg, Imhof and Keller (2015) researched educational interventions to increase pro-environmental behaviour on high school students. They argue that environmental education in nature is significantly more effective to increase the motivation for pro-environmental behaviour than indoor education. This intervention was most effective when it was implemented for longer than five days. The importance of a longer duration of time spent in nature is confirmed by Collado, Staats and Corraliza (2013), who argue for long-term or repeated experience in nature. These authors also mention the importance of exposure to nature from an early age on, since attitudes about natural elements (e.g. animals) are formed between 10 and 12 (ibid.). Influencing the beliefs of youngsters is also addressed in the interviews by several experts. Toon Cillessen, Chair of Developmental Psychology at Radboud University Nijmegen, considers explaining or clarifying the effects of behaviour as part of the best way to influence youngsters' behaviour. He claims that youngsters are very sensitive for the negative effects littering has on nature[1]. Tessa de Been, NME-consultant 'Het Groene Wiel', agrees with him and states that teaching about the effects of littering should be part of an intervention in order to see the problem in both a wider perspective and a local perspective[2].

Based on the above mentioned literature, we see possibilities in reducing littering behaviour by providing outdoor environmental education to create a more positive attitude towards the environment. We see the increase of knowledge on the effects of litter as a starting point for actually addressing littering amongst youngsters. By increasing their knowledge on the negative effects of littering, the costs of littering may outweigh the benefits. Therefore, youngsters may form a more negative attitude towards littering. One way of doing this is providing outdoor education. Important for this sort of education to be effective, is frequent exposure to the intervention in natural surroundings.

Besides focusing on the effect of littering in the natural environment, an intervention can also focus on these effects on society or on youngsters themselves. Lotte Penninx, psychologist specialized in

child and adolescents, explains that youngsters are very much focused on themselves in this phase, and are usually dealing with important questions to discover who they are and what they want. Penninx argues that it is therefore important that their social environment teaches them what is important for society; *"This will not come from the youngsters themselves, so it is important to teach this to them"*[3]. Child and youth psychologist Marie-Anne Lamers notes that the communicated consequences have to be relevant to the experience of youngsters. As a possibility to influence youngsters, she mentions making them aware of the inconvenience of litter for their hangouts. The direct consequences of littering for youngsters themselves should therefore be clear in interventions[4]. Jephta Peijs, researcher and game designer at 'IJsfontein', states that timing is important. She also indicates that it is good to realize that behaviour is often ingrained in individuals. Therefore, she sees the effectiveness of educational interventions as limited[5].

Recommendation:
Our findings indicate that a key characteristic for effective interventions is that they focus on consequences that directly affect the youngsters themselves. When influencing youngsters we believe it will be effective if youngsters experience the negative effects of littering themselves in their daily lives. Within interventions, direct consequences for youngsters should be addressed. In this way, their attitude can be influenced. Our research did not look in to what youngsters perceive as consequences of litter for themselves. Future research should clarify this and can give interesting clues in how to address this.

"That's just laziness!"

In the literature, laziness is described as another determinant of littering (Lyndhurst, 2013; Al-Khatib, Arafat, Daoud & Shwahneh, 2008.). A youngster can perceive the consequences of walking to a bin to throw something away as negative because it costs effort or energy to do so. Therefore, his or her attitude towards littering is positive, as it will cost him or her less energy. In this case, the benefits of littering are higher than proper disposal. This person can be labelled as lazy. An example of a youngster describing his laziness: *"I'm not the kind of person who walks dutifully to the trash, that's just laziness. Especially at parties or something, I tend to think: Well, they will clean anyway, so what is one more paper? That is bad isn't it?!"* (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 2010, p. 28).

We found one evaluated intervention in the literature that seemed to have aimed at influencing the laziness of people. The intervention focused on changing the environmental design to target laziness by decreasing the distance to bins. It seemed that this intervention was effective since passive littering behaviour even transformed into active non-littering behaviour (Sibley & Liu, 2003). This connects to a statement from child and youth psychologist Marie-Anne Lamers. She says that it is important to facilitate desirable behaviour for youngsters to make it as easy as possible for them to throw trash in the bin. According to Lamers, this will increase the chance to change behaviour. She says: *"Create conditions such as bins. Make it easy for youngsters to dispose their trash*

somewhere"[4]. Thus, it can be effective to try to overcome the (potential lazy) attitude of youngsters in addressing their littering behaviour.

Recommendation:
In our opinion, having influence on the laziness of this target group will be very challenging. Therefore, it seems most desirable to facilitate youngsters' behaviour instead of changing it completely. This can be done by making it as easy as possible for them to dispose their waste properly. For example, municipalities can look at spatial design, e.g. the positions, and amount of bins. Since intervention designers and implementers are limited in their possibilities regarding spatial design, our advice would be to address this to a municipality. The environmental design is elaborated upon in paragraph 2.2.5.

"Someone else will clean it"

When youngsters have the belief that others will clean their litter, they are more likely to produce litter. The perceived costs of littering are considered lower than the costs of proper disposal. A citation of a youngster illustrates this: *"Whatever, someone else will clean it"* (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 2010, p. 60). Youngsters shift the responsibility of their behaviour to other parties, such as the municipality or school staff, and do not feel responsible themselves. Thus, they do not see negative consequences, the costs of littering, and therefore they lack a negative attitude towards littering. Interventions aimed at influencing this belief of youngsters seem to be related with the perceived responsibility by youngsters, one of the determinants that will be elaborated upon in the section on social norms.

Interventions aimed at changing the belief that others will clean up the litter, include prompts and giving information. One intervention that used the slogan "*If not you, who? (It's the right thing to do)*" was effective on tourists for the target behaviour: the picking up of litter (Brown, Ham & Hughes, 2010). Other research shows that a more personalised or tailored message is more effective, as well as individual feedback (Stead, McDermott, Broughton, Angus, Hastings, 2006). We did not find evaluated interventions specifically on youngsters that targeted the belief that others will clean, which is a limitation in published literature.

Receptivity

We identified another determinant based on the expert-interviews: the receptivity, meaning the extent to which youngsters are open to interventions. Multiple experts (Marie-Anne Lamers; Jephta Peijs; Tessa Lansu; Lotte Penninx) say that it is important to connect to the lives and worldviews of youngsters if you want to change their behaviour. By doing that, youngsters will become more open to interventions about littering. Jephta Peijs, researcher and game designer at 'Ilsfontein'[5], says: *"Youngsters are very enthusiastic, they do not hold back. This has to do with their stage of cognitive development. If you know how to excite this enthusiasm, youngsters will be very involved and active."* She recommends to make use of their enthusiasm and curiosity in order to change their

behaviour. As an example she says that games offer this possibility and create an open attitude towards interventions on littering.

Tessa Lansu, assistant professor Developmental and Psychogerontology at Radboud University Nijmegen, also says that it is good to *"meet the goals and motives of youngsters and have a connection with these existing goals and motives."*[6] Lotte Penninx, Child- and Youth-Psychologist, gives an example of how this can be achieved by introducing a bin with a basketball net on top of it. She believes that involving a game, challenging or fun element in proper disposal, will increase the chance of youngsters actually making use of the bin. In general she states: *"I think behaviour change can become attractive by looking at what youngsters like. Connect it to something that is interesting for them, for example a computer game or social media."*[3] Marie-Anne Lamers, child and youth psychologist, expands on this and suggests implementing a funny element for throwing trash into bins, for example by creating a bin that makes music after it is used[4]. Summarizing, we strongly believe that receptivity can be stimulated by connecting interventions to the lives and worldview of youngsters. It was beyond the scope of our research to reveal how to tackle this problem in practice. Future research could give answers to the latter.

Recommendation:
When it comes to intervention designing, our advice would be to try to connect to the interests of youngsters as much as possible. Since it is challenging to influence them, we see this connection in communication as very important. Changing littering behaviour should be fun and challenging for youngsters. We recommend looking into what it is that youngsters find interesting, or what makes them enthusiastic and curious. So not only look at rational ways like providing information, but involve youngsters and their lives actively in the problem.

A few other determinants that have influence on the littering behaviour of youngsters are found. Unfortunately, we did not find evaluated interventions that address these determinants. However, the determinants should not be ignored since they give insight in youngsters' thoughts and knowledge that form a certain attitude towards littering.

Size and biodegradability

Another determinant of littering behaviour is the size of the waste. Small waste may not be considered litter by youngsters, and is therefore littered more. It has for example been found that the belief whether cigarette butts are litter predicts the amount of cigarette butts someone throws on the ground (Rath et al., 2012). Youngsters can also take into account their beliefs about the biodegradability of the packaging material. Packages that they believe can degrade easily are considered appropriate to throw onto the streets (Schultz, 2009).

Inconvenience of keeping the package

Another reason for youngsters to litter is the inconvenience of keeping the package. They feel reluctant to carry 'dirty' or 'unclean' items themselves (Lyndhurst, 2013), thus the costs of keeping the litter are higher than the benefits of throwing it on the street. Therefore, youngsters tend to

litter dirty items. An intervention in drive-in restaurants described by Dwyer et al. (1993) showed an increase in the use of litterbags and thus facilitated proper disposal. However, this intervention was combined with rewards (coupons), and the effects of these interventions cannot be separated. Furthermore, it was not targeted specifically on youngsters and therefore we cannot draw conclusions from this intervention.

Getting caught

The idea of getting caught can influence youngsters' behaviour as well. The chance of getting caught is in this situation defined as the probability that adults see that youngsters produce litter. The lower the chance that adults will see it, the higher the chance that youngsters will litter. Places such as hangouts, candy routes or supermarkets can be places where the chance of getting caught is low. Consequently, the chance of littering behaviour by youngsters is high in those areas. (SenterNovem & Stichting Nederland Schoon, 2009).

Recommendation:
We would recommend to have a realistic expectation to the effectiveness of influencing youngsters' attitudes. As stated earlier, changing youngsters' attitudes is challenging. However, based on the above, we believe some influence is possible.

Targeting the attitude of youngsters ... what to take into account?

- *Provide education on pro-environmental behaviour*
- *Influence beliefs about effects of litter*
- *Make proper disposal easy*
- *Create open attitude for change*

Back to Jasper

Seeing the candy routes as very disturbing, the municipality where Jasper lives conducted a large scale intervention. The municipality asked NME to work on this project. NME has selected Jasper's school for their first pilot project. For the start, the NME introduced a competition/game that Jasper and his classmates have to join. In this game they will learn about the effects of litter. In the beginning Jasper was not very interested in this, he thought of it as another obligation within school. But when the intervention started he got interested. It was fun to play a game and even kind of interesting to learn about effects of littering in this way. Within the game Jasper scored a lot of points for not littering. Another thing he noticed was the bin with a basketball net on top of it that was placed on the way to the supermarket. Because it was fun and challenging to throw it in the net, Jasper tried to throw it in the bin each time he passed it. After it was taught to him in a fun way what effects of littering can entail, Jasper thought more negative about littering.

2.2.3. SUBJECTIVE NORM

The subjective norm refers to the perceived social pressure to perform or not to perform certain behaviour. This subjective norm is an individuals' perception that is determined by normative beliefs. The subjective norm explains the perceived likelihood that important peer(s) (groups) approve or disapprove a performing behaviour. People generally experience a motivation to comply with the beliefs of an important person or group in their environment. (Ajzen, 1991). In this section, we will discuss both the determinants we considered to fall under the subjective norm and interventions we evaluated as targeting these determinants.

There are two types of social norms that are relevant in the context of littering. These two norms will often be repeated in this section: the descriptive norm (what most people do) and the injunctive norm (what the society or a group considers ought to be done). (Lyndhurst, 2013)

Peer influence

Peer influence is a strong determinant of the subjective norm in groups of youngsters. From eight out of nine of the expert interviews, we found that peer influence was thought to be the strongest contributor in changing youngsters behaviour. Youngsters feel the need to belong to a group (SenterNovem & Nederland Schoon, 2009; Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 2010) and they manifest themselves in relation to their peers, as is described in Jasper's case. For youngsters, peers are known as their first and foremost 'significant others' in their social life, even more important than any other actor including their parents (Bester, 2007).

Long, Harre and Atkinson (2014) held a focus group discussion with youngsters (senior high school students) about their littering behaviour. One youngster explained the friends he hangs out with influence his littering behaviour greatly. These friends can have a positive as well as negative influence on the littering behaviour. In study by Müller (2011), we also found that youngsters' handling with waste is co-determined by how they want to be seen by others in their surroundings. This explains why young people are more likely to litter in a group compared to when they are alone. They fear they are being ridiculed or excluded by their peer group when they do not act in a way

that conforms the group norm. "*In the schoolyard is only one bin on the other side of the square. No way that I am going there [bin], I will be a laughing stock."* - Cynthia (Senternovum & Nederland Schoon, 2009).

Henk Staats, professor of environmental behaviour at Leiden University, states that addressing youngsters in their groups is the most effective way to intervene in their environmental behaviour. Therefore, in terms of shaping the desired subjective norms towards littering behaviour, intervention designers need to pay attention to the roles of peers in building the strategies[7].

Strategies to manipulate peer influence can be seen in two different routes of change, the descriptive and injunctive norm route. The first route that will be explained is the route of the descriptive norm. A study from Long, Harre and Atkinson (2014) that was conducted in a high school student network, revealed that youngsters who see their peers litter are more likely to also litter themselves. Other research came to the same conclusion, demonstrating that there is a tendency of a person to litter because they imitate prior litterers (Cialdini, Reno & Kallgren, 1990). This gives us the impression that the mere presence of most other peers who litter are already providing youngsters with a certain norm that littering is an acceptable behaviour to follow. A method to reduce littering behaviour that can operate via this descriptive norm, is by making pre-existing attitudes and beliefs in the targeted setting salient (Stead, McDermott, Broughton, Angus, Hastings, 2006). We suggest two practical strategies that work under this method.

The first manner is by prompting the existing (desired) norm (Winter, Sagarin, Rhoads, Barret & Cialdini, 2000). For example by putting a visible board or announcement that says *"86% of youngsters are throwing their garbage to the bin"* or *"86% of youngsters believe littering is not cool"* in the targeted setting. According to Tessa Lansu, assistant professor Developmental and Psychogerontology at Radboud University Nijmegen, prompts that directly target youngsters, will automatically provide a standard for them on how to act towards litter[7]. The second strategy is by giving feedback of the targeted behaviour and to make this publically visible. For example, by comparing the amount of litter on the day and day before in a newspaper (Stead et al., 2006). For both prompting and giving feedback, using the right communication channel is always important in building a good intervention. Designers should look at various communication channels that might produce the greatest chance of exposure and effect on youngsters. A study by Lee (2011), that is conducted amongst youngsters, found that exposure through media is effective in reaching more youngsters to involve in the responsible environmental behaviour. More specifically, he recommends to look at the role of new media, which enables more interactive and interpersonal forms of communication that is attractive to youngsters (Lee, 2011). According to Maarten Jacobs, environmental psychologist at Wageningen University, new media such as film, internet, or social media are recommended to socialise such issues towards youngsters[8].

The second route to facilitate change in norms, is by influencing youngsters through the injunctive norm (what the society or a group considers ought to be done). It has been mentioned previously that the feeling to be part of a group is greatly valued by youngsters (SenterNovem & Nederland Schoon, 2009; Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 2010). Therefore, the pressure to perform according to the desired behaviour (norm) of the group can be high. Creating a new desired norm in the group may greatly impact the effectiveness of the

intervention. We suggest two practical strategies to be used by intervention makers that can support the creation of the desired norm. We call these peer-based interventions.

The first strategy is making a segmentation, i.e. a division of youngsters in groups. The effectiveness of an intervention is related to existing attitude of a person towards the issue (Bolderdijk, Gorsira, Keizer & Steg, 2013). For youth segmentation, groups can be divided in a hard-to-shift (hard to be persuaded) group and an easy-to-shift (easy to be persuaded) group or a group with environmentally minded youngsters and an opposite group that does not care about the environment (Long, Harre & Atkinson, 2014). Making segmentation in the planning phase of a group intervention is recommended.

The second strategy is to use well-known/respected/popular persons as the influencers within the group. Using these people in the targeted setting has been found to be effective to change the behaviour of the group in many studies (Long, Harre & Atkinson, 2014; Stead et al., 2006). According to Tessa Lansu, assistant professor Developmental and Psychogerontology at Radboud University Nijmegen, this means that intervention designers may have to think of ways to firstly take the 'popular people' position to their side[7]. Choosing the right 'influencer' is the starting point and determines the effectiveness of an intervention. Counter effects are not uncommon: direct requests to stop littering from peers can be considered as bullying, mocking, etc. (Long, Harre & Atkinson, 2014). Therefore, we recommend intervention designers and implementers to value peer networks when choosing the influencer and to let the group itself nominate their own 'leader' from their group/network. Youngsters are more connected to their friends in their own network and immediate friends influence them quicker than average or non-friends within their social network (Long, Harre & Atkinson, 2014). When the influence comes from a person who is placed far within their own social network, the effectivity to change behaviour amongst youngsters can be low. Choosing the right 'leader' can be a way to build a supportive group to enhance the effectiveness of the intervention (Stead et al., 2006). However, counter effects of using these people may also arise, because when these 'people' become less popular the effectiveness can be reduced (Fisher et al., 2002). Giving rewards for the accomplishment of the group must also be taken into account to increase the effectiveness of the intervention (Dwyer et al., 1993).

The third strategy to influence the injunctive norm is by prompting (Houghton, 1993). When prompts are used, some rules have to be taken into account. Firstly, prompting has to be addressed via different pathways at the same time. For example, Houghton (1993) describes interventions for secondary school students that tried to target the injunctive norm in two manners: by verbal prompts by an older scholar that students should keep the school clean and by showing a visual prompt (a poster) with the message "please do not litter". Houghton found that the combination of verbal and visual prompts was more effective than using just verbal or visual prompts alone. Secondly, prompting is found to be more effective when it explicitly mentions social norms rather than giving explicit demands. Reich and Robertson (1979) found that prompting through explicit commands against littering (i.e. "Do not litter!") created reactance by youngsters to the act of littering and generated more litter. A direct appeal directed to social norms (i.e. "Help keep your pool clean"), accounted for less litter. However, Reich and Robertson (1979) found only a small reduction in littering behaviour.

Recommendation:
Peer influences are found to be very important in littering behaviour amongst youngsters. In our opinion, we think the involvement of peers in interventions is unavoidable. According to the literature this is changeable by making the desired norm recognizable by the use of *prompts*, giving *feedback* through the use of the right communication channels that also fit in well to the youngsters' life (like new media).
Youngsters are susceptible for the descriptive and injunctive norms. Therefore, we recommend to make the pre-existing norms visible, verbal and visual. Also very recommendable is to involve the peer group in creating a new desired norm from within. By letting youngsters choose their own role model, they are more likely to copy the behaviour of well-known and respected peers.

Personal Norm

The second determinant within social norm we found for youngsters' littering behaviour is their personal norms or internalized norms. According to Lee (2011), internalized values that are communicated by peers are likely to be translated into norms. He says that individuals' significant networks (like peers) could suggest, cultivate, circulate and reinforce a norm of environmental behaviour. Also, media form personal norms regarding pro-environmental behaviour firstly by giving information about environmental issues, secondly by adding values to these issues, and thirdly by defining what is found to be legitimate or moral by the society. (Lee, 2011). This implies that personal norms are formed by values that are primed and framed by media and important people in one's social environment.

In personal norms, the behaviour is controlled by how somebody evaluates the consequences of his or her behaviour (e.g. feelings of guilt) (Kinzig et al., 2013; de Kort, McCalley & Midden, 2008). An intervention by de Kort, McCalley & Midden (2008) found that norm-activation through personal norm appeal did not have any effect on youngsters' littering behaviour. They argued that youngsters may have less developed personal norms compared to older people. Therefore, they suggest that there might be a smaller chance that youngsters will feel guilty (or pleasure) when they are exposed by messages that inflict a personal norm.

Type of company

The type of company is another determinant of the subjective norm. Youngsters have the sense to 'do the right thing' and feel responsible for their actions in a certain company. For example, youngsters are more likely to litter when they are surrounded by their peers than, for example, by 'respectable persons' like parents or teachers. We believe that type of company is difficult to be influenced since each youngster may place their respect differently to every person. However, as peers are the most valuable influencers in youngsters' life, targeting to increase sense of responsibility in the group level can be promising. An approach for this is by using group

commitments (Stead et al., 2006). Since the involvement in the (social) context seems highly relevant to youngsters, interventions aimed at this seem promising.

Sense of Community

The sense of community is an important determinant with regard to the type of company; this refers to taking pride to belong within a neighbourhood or local area. Without a strong sense of community people are 10% more likely to litter. In this situation the fear of social sanctioning is a strong driver. (Lyndhurst, 2013).

The degree of involvement can determine the sense of community amongst youngsters. The degree of involvement in the context is found to be related to littering behaviour (Van de Water & Velt, 2008; SenterNovem & Stichting Nederland Schoon, 2009). For example, youngsters tend to be more involved in their homes and sport clubs and litter less than in a random place in the city. Child and youth psychologists Lotte Penninx and Marie-Anne Lamers state that when a desired behaviour is present in different living areas (like the football club, in the city centre or at home) this behaviour becomes 'normal', and has an effect of the norm. Youngsters will not always behave for the full 100% in this desired way, but it will most likely have an effect on their behaviour[34]. An explanation for this tendency is probably because they are involved highly in those contexts. Their sense of responsibility to act accordingly to the norm of that context is also developed. Lotte Penninx says that the presence of a desired norm in several life areas is very important to change the normative beliefs of youngsters[3]. Having this insight, we suggest that intervention designers may have to consider a strategy that can help youngsters to develop a desired norm by inviting them to involve in the context. Huffman et. al (1995) found that the more socially involved the person to the intervention is, the bigger the effect of interventions to change littering behaviour was. Youngsters could, for example, be involved with other stakeholders in the targeted setting to join the intervention, such as cleaning up the environment together (Huffman et al., 1995; Stead et al., 2006; Long, Harre & Atkinson, 2014). Another strategy that is linked to this is to make the authority of the setting (e.g. the teacher or police men) salient of the problem and involve them (Stead et al., 2006; Long, Harre & Atkinson, 2014).

Recommendation:
Since the social context is found to be very important for youngsters, interventions aimed at this seem promising. An approach that is found to be effective in targeting the sense of responsibility amongst youngsters is the use of group commitments. Next to this, group commitments and the degree of involvement in an community seem to have influence on youngsters' littering behaviour. Therefore, we recommend to actively involve youngsters into a context to give them a feeling of responsibility and the need to comply with the norm.

Number of people present

Another determinant related to social norm is the number of people present in the setting. With this determinant, it is important to make a distinction between group size and crowding. The group size means the number of people who are together with the individual. Crowding is the density of people in a certain location, where you behave anonymously. Durdan, Reeder and Hecht (1985) found, in

his study about the effect of group size on littering behaviour, that students were less likely to litter when they were seated in larger groups, where the norm is more felt. Cynthia, a secondary school student feels the social pressure that is influenced by the group size: *"When we are at 't Twiske (canteen) and someone starts cleaning, I will help very easily. Often you see that others also will help. When I am alone I feel less sure about my handling, especially when people are staring at you when you throw away your waste"* (Senternovum & Nederland Schoon, 2009).

Meeker (1997) found that the amount of litter increased with the number of persons at a table. The 'number of people present' is related to the diffusion of responsibility. However, it is hard to influence the number of people that are present in youngsters' daily life. We think the strategies to change their behaviour related to the number of people present can be influenced by external factors such as interventions through environmental strategies, having prompts around that is targeted on social norm, and apply regulation. The same advices also apply for the group size. It may be impossible to influence the size of the group. Durdan, Reeder and Hecht (1985) conclude that prosocial behaviour, like disposing your own waste properly in order to not bother other people, tends to decrease when there are more people present, based on diffusion of responsibility. This means that no one feels responsible for cleaning the area.

Anonymity of the physical environment

The anonymity of the physical environment also plays a role in deciding whether or not to litter (Lyndhurst, 2013). These anonymous environments can be desolated or hidden areas (like forests or remote parking lots). Potential litterers tend to litter more easily in sites that create a sense of anonymity, where no one can see them. A possible explanation for this is the unnoticeable social pressures that many times hold people back from littering, and therefore people may litter more easily in anonymous environments. A recommendation could be to apply visual prompting strategies that appeal on the social norms. No further suggestions are there because the anonymity cannot be controlled.

Size of the packaging

When making the decision whether or not to litter, youngsters also look at the *size of packaging.* For some youngsters, littering large packages is aimed to act cool in front of their friends. The bigger and solid the package, the more it will be noticed by friends that they litter, because of the noise it produces (Van de Water & Velt, 2008). However, Van de Water and Velt (2008) indicate that youngsters experience the littering of large packages to conflict stronger with the social norm, precisely because it is more visible. Small packages are therefore littered more easily by youngsters (Van de Water & Velt, 2008; Lyndhurst, 2013)

Recommendation:

The number of people that are present (crowding and group size) also seem to have an influence on the littering behaviour. In the case of crowding this mostly has to do with the descriptive norm; in case of group size the injunctive norm plays a role, just like the diffusion of responsibility. Since the amount of people present is not changeable via an intervention, it is found to be less important for intervention designers. A way to intervene is to *prompt* the desired norm in such settings in order to have an influence on the responsibility. For the determinants of anonymity of the physical environment and the size of the packaging, there are no further suggestions.

Targeting the norms of youngsters ... what to take into account?

- *Making salient existing positive attitudes and belief*
- *Peer-based intervention*
- *Active involvement of youngsters*

Back to Jasper

The NME has decided to set a peer-based intervention in Jasper's school. All students were asked to join a group discussion concerning littering behaviour. Since students were allowed to form their own group, Jasper invited his closest friends. "It was enjoyable! The researcher was fun.", Jasper said. Jasper did not feel interrogated. A month has passed, a big banner saying "80% of the students in the town think littering is not cool!" is hanging on school wall. It surprised Jasper a lot. Until now, he thought littering is super cool. Back in school, another event developed by the NME was waiting. All people in school are involved in a-day-without- litter-challenge. Teachers invited the previous discussion groups to nominate one person from each group to become the committee for this event. Since Jasper is the most respected person in his group, he was chosen. Jasper got the task of checking his friends in their littering behaviour in order to win the challenge. The reward was a free ice cream in the break. After these activities, Jasper and his friend started to think about their behaviour. "We have to change.." they told each other.

2.2.4. PERCEIVED BEHAVIOURAL CONTROL

Perceived behavioural control is someone's belief about the ease or difficulty of performing behaviour. This perceived behavioural control is determined by an individual's control beliefs; these are an individual's beliefs about the presence of factors that facilitate or impede performing behaviour. For example, think about studying for a difficult test. If you think that studying an extra hour will result in passing the test, then your perceived behavioural control is high. If you cannot think of anything within your power you can do to pass the test, than your perceived behavioural

control will be low. Like attitudes and subjective norms, the relation between perceived behavioural control and behaviour takes place via behavioural intention. Unlike attitudes and subjective norms, perceived behavioural control has also been found to be a direct predictor of behaviour. This is because 1) if you hold intention constant, it is more likely that this will turn into actual behaviour when there is an increase in perceived control and 2) perceived control can be seen as a substitute for actual control. (Ajzen, 1991). Perceived behavioural control is believed not to be the most important factor in determining littering behaviour[9].

Time constraints

One determinant that is directly related to perceived behavioural control is whether the individual is in a hurry or not (Schultz, 2009). A lack of time can then be seen as an impeding factor to the control an individual perceives he has in taking the effort to throw away his or her waste. We are not aware of any interventions that have tried to change whether a person is in a hurry or not. This is probably due to the difficulty with changing this determinant.

Recommendation:
We assume that placing more bins might reduce the littering behaviour of youngsters who are in a hurry. However, we did not find literature where we can base this on.

Back to Jasper

After going to the supermarket, Jasper and his friends are always in a hurry getting back to school, because they do not want to be late for class and risk detention. When Jasper walks back to school he feels that he does not have the time to walk past the bin to throw away his garbage, even though it is just twenty meters behind him, and throws it in the bushes. Together with the municipality, the NME decides to place some extra bins next to the 'candyroute' which are also easier to reach than the previous one. The next day when Jasper hurries back from the supermarket, he feels it takes less effort to throw away his candy wrapper and throws it nicely in the bin as he walks fast past it.

2.2.5. ENVIRONMENTAL FACTORS

Environmental factors and the Ecological Systems Theory

Environmental factors can be described as all factors residing outside an individual that influence one's behaviour. The Ecological Systems Theory of Urie Bronfenbrenner (1979) states the importance of the interaction between individuals and systems (which can be seen as a bundle of environmental factors) residing outside of the individual. In this theory, systems are being differentiated with regard to the distance between the system and the individual. The layer closest to the individual is called the microsystem. This system consists of elements that most immediately and directly influence an individual's behaviour, like family, school or sports club. At the most outer systems reside those elements that constitute an individual's culture and the laws he or she has to obey. Figure 2 (Language As Culture, 2011) illustrates the different systems and their influence on the individual's behaviour. The interactions between these systems change over time, which is described by the chronosystem. An implication of this system is that the situation that is described in this research can only be applied to youngsters. The interaction that they have with their environment changes as they grow up; changing the nature and strength of many determinants of littering behaviour. This theory shows us that an individual's behaviour, which until now has been regarded as an aggregate measure of an individual's attitude, subjective norms and perceived behavioural control, has to be considered in a wider context of environmental factors that also exert their influence on an individual's behaviour.

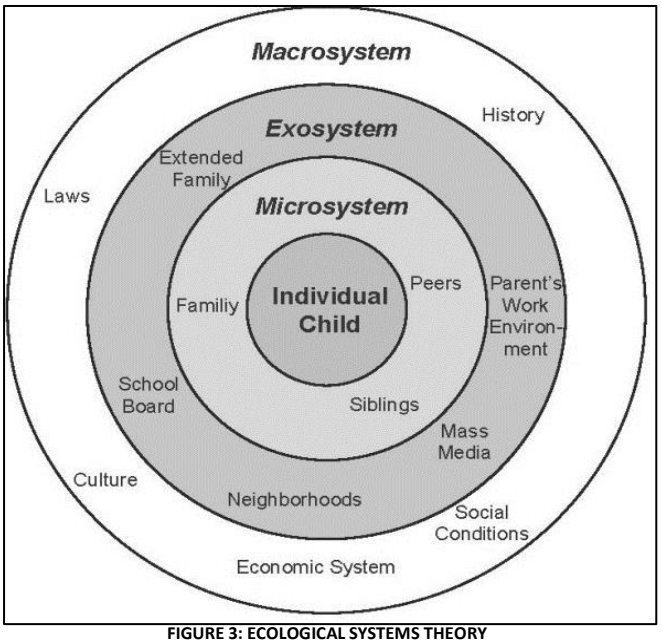


FIGURE 3: ECOLOGICAL SYSTEMS THEORY

Source: Language as Culture (2011)

Environmental factors and its influence on behaviour

Incorporating the TPB and the Ecological Systems Theory, we argue that there are three ways in which the influence of environmental factors on behaviour occurs. The first is through its influence on the attitude, subjective norm and perceived behavioural control, the second through its influence on the intention gap and the third through its influence on behaviour directly.

Environmental factors influencing attitude, subjective norms and perceived behavioural control

One way in which environmental factors influence behaviour is through its influence on attitude, subjective norms and perceived behavioural control. This means that environmental factors can influence these three aspects, which in their turn influence behavioural attention and behaviour. As an illustration for the ability of an environmental factor to influence behaviour through a change in attitude, take someone that badly wants something to snack, but has to drive an hour to the nearest supermarket. In this case, the distance to the nearest supermarket is an environmental factor.

Having to drive an hour might make this person feel that the negative consequences of driving for that long time does not outweigh his or her desire for a snack. Therefore, an environmental factor influenced behaviour through a change in attitude. As an example that shows the ability of environmental factor to influence behaviour through a change in subjective norms consider someone that sits in a full bus when an elderly person enters. Normally, while sitting in a city bus, this person would immediately stand up to make room for the elderly person to sit. However, now he or she is sitting in the bus to the university full of students who are too busy with themselves to stand up for an elderly person. Seeing that no one plans on offering his or her seat to the elderly person, a change is made in his or her subjective norm and he or she decides to stay seated. This example shows how the environmental factor of destination of bus can influence behaviour through a change in subjective norm. Lastly, to illustrate how an environmental factor can bring about a change in perceived behavioural control and thus behaviour, consider someone who just got their driver's license. When the only road to his or her destination is very curvy, he or she starts doubting if he or she can actually drive there, which, in the end, results in him/her staying home. In this way, the environmental factor road structure influenced his/her behaviour through a change in perceived behavioural control.

Environmental factors influencing the intention gap

Intention to perform a behaviour does not necessarily translate into performing that behaviour. For example, Sheeran (2002), in his meta-analysis on the translation between intention to behaviour, found that 28% of the variance in behaviour could be explained by intention to perform that behaviour, resulting in what is called 'the intention gap'. Whether behavioural intention results in behaviour is influenced by the facilitating or inhibiting role of environmental factors on the intention gap. Take for example a person that craves a cup of coffee and has both the time and money to go and get one. Whether this behavioural intention can actually be realized into behaviour is heavily dependent upon environmental factors, like the opening hours of the coffee shop or whether the person encounters a road obstruction. In sum, environmental factors influence behaviour through its facilitating or inhibiting influence on behavioural intention. This is illustrated in figure 3, an extended drawing of the Theory of Planned behaviour including the environmental factors.

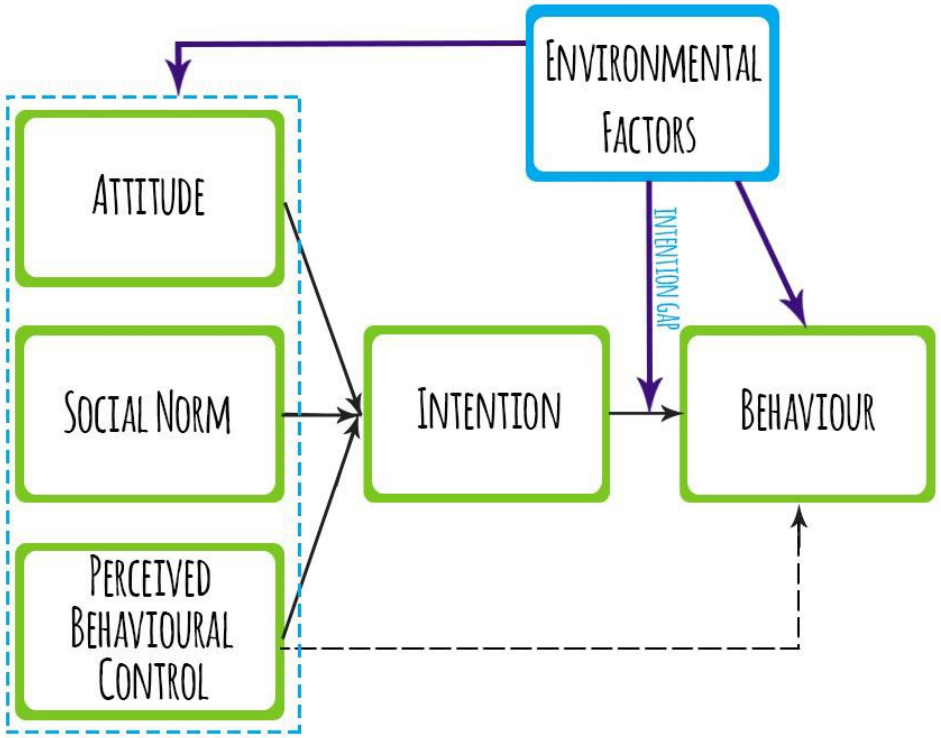


FIGURE 3: ILLUSTRATION OF THE EXTENDED THEORY OF PLANNED BEHAVIOUR

Environmental factors directly influencing behaviour

Environmental factors also influence behaviour directly (see figure 3). However, this influence on behaviour does not appeal to conscious processes, but instead appeals to subconscious processes in the brain. Many people think of themselves as rational beings, being able to make an informed decision based on the available knowledge. However, subconscious processes take into account many details of the environment and influence decisions without knowing. In sum, environmental factors influence behaviour directly through our sub-consciousness.

Considering littering behaviour, it has been found that littering behaviour is influenced by both conscious and subconscious processes (Williams, Curnow & Streker, 1997), which can be thought of as habits (Lyndhurst, 2013). Lyndhurst (2013) notes that this subconscious littering behaviour is especially common amongst youngsters. This underlines the importance of not only taking into account ingredients that tackle conscious littering behaviour but also to look at ingredients that tackle subconscious littering behaviour. Jeptha Peijs, researcher and game designer at 'IJsfontein', agrees that different mechanisms need to be used when tackling conscious and subconscious behaviour. She argues that the most important aspect of tackling subconscious behaviour is to make people feel good; making them want to repeat the behaviour that led to this great feeling. An important aspect of tackling conscious behaviour is not to fall into the caveat of being pedantic, but to let youngster set their own goals[5].

Now that we have looked at the ways in which environmental factors influence behaviour, we will turn to environmental factors to determine littering behaviour that have been found in literature

and conducting interviews. It is important to keep in mind that one environmental factor can influence behaviour in more than one way.

Tessa Lansu, assistant professor Developmental and Psychogerontology at Radboud University Nijmegen, has mentioned the importance of paying attention to the environment or situation when targeting littering behaviour amongst youngsters[7]. However, environmental-design interventions that address environmental factors have been found to have smaller effect sizes than treatments that are aimed at different areas, though they do have the potential to be effective (Stead et al., 2006)

Environmental factors that influence littering behaviour

The effect of existing litter level

One of environmental factors that influences the littering behaviour via the subjective norm (see figure 3) is the is the existing litter level in an area (Kukreja, 2014; SenterNovem & Stichting Nederland Schoon, 2009; Müller, 2011; Cialdini, Kallgren & Reno, 1991; Reiter & Samuel, 1980; Geller, Witmer & Tuso, 1977). This means that people tend to litter more easily when the environment is already polluted. This refers to the conception that one more paper on the streets does not matter, because there is already a large amount of litter. This is confirmed by empirical studies on the accumulation of litter. Dur and Vollaard (2012), for example, found that a small amount of litter on the streets led to a faster accumulation of litter than streets without litter.

We think that quick cleaning services can prevent the accumulation of waste. According to Dur and Vollaard (2012) waste namely accumulates more in places where there is already litter present. An aspect related to the existing litter level that influences littering behaviour is smell, because this is often also associated with cleanliness and people might be repulsed to get near a bin when this smells unpleasant. A way to spread a 'clean' smell is to use dispensers that distribute the smell of lemons, as this smell activates people's cleaning and pro-social behaviour. Another aspect that is related to cleanliness of a place is the presence of smooth and shining surfaces, for instance the bin itself but also the floor around it or the packaging used, because this is also associated with cleanliness. A third thing that needs to be taken into account is that some areas are littered less than other areas because people relate to it, for instance churches or beautiful landscapes.

We recommend intervention designers to keep the litter level low, keep away smells from areas where much litter accumulates and to make bins and the immediate surroundings of bins smooth and shining. Another recommendation is to place images of these areas on bins or for instance on a video wall in shopping centres. (Broeder et al, 2010).

The bins!

Other important environmental factors that predict littering behaviour are the *amount of bins,* the *distance to the bin* and *fullness of the bin* (Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, 2010; SenterNovem & Stichting Nederlands Schoon, 2008; Ojedokun & Balogen, 2011;

Lyndhurst, 2013; Kukreja, 2014; Meeker, 1997; Keep America Beautiful, 2009). If there are few bins, the distance to the bin is big and/or the bin is already full, people are more likely to litter. Child and youth psychologist Marie-Anne Lamers argues that enough bins in the surrounding is more of a precondition for proper waste disposal than something that changes youngsters littering habits. But this is a precondition nonetheless. It is important to make the desired behaviour as easy to perform as it can be[4]. This illustrates the existing relations between the environment and the determinants of littering behaviour, as costs and benefits are weighed for the disposal of waste. We did not find any interventions tackling these determinants, though a change in littering behaviour may be realized with more bins available that are emptied regularly.

The *characteristic (attractiveness) of the bin* can also be regarded as an environmental factor influencing littering behaviour. For example, whether an individual has to lift the lid of the bin, the opening size of the bin or the height of the bin can all have an effect on littering behaviour. This is also an example of how the relations between one's attitude and the environment work.

As is discussed above, Lotte Penninx argues that mainly a heightened attractiveness through incorporating an active element into the bins is most useful in changing youngsters littering behaviour. She argues that a change in colour of the bin will not change littering behaviour, but that placing a basketball on top of a bin will make throwing trash into the bin more active and challenging and thus result in more proper waste disposal behaviour[3].

We therefore recommend to make bins as attractive as possible and intervention designers to make interventions as active as possible.

In Landgraaf, the Netherlands, the municipality developed a policy on the placement of bins. The outcome of this policy was that the amount of bins had to be used in a more efficient manner and in order to do so the amount of bins was reduced. The implementation of this policy led to less littering even though the amount of bins was reduced. They also changed the characteristics of the bins; openings became smaller and the bins itself bigger. Furthermore, the bins could now be used for both waste and dog poo. Bins were removed from the outer area of the municipality, except for the entrances of these areas. More bins were placed in shopping areas and bus stops. What was also implemented was the use of bins that could be moved around with youngsters' hangouts, as these tend to change over time. A last aspect that was taken into account is that bins should not be apart from each other more than five minutes of walking distance. (Gemeente Schoon, 2013).

Much of the littering from youngsters takes place on so called 'candy routes' (Dutch: '*snoeproutes'*). These are the routes that youngsters take from school to home and from school to the supermarket during and after school. These routes are often heavily polluted. The *distance* from school *to the nearest supermarket* then can be seen as another environmental factor influencing littering behaviour. If youngsters are able to go to the supermarket during their break because it is nearby, they will litter more than when they are not able to go there.

There are some strategies that can be used in order to reduce the amount of littering that is related to the distance to the nearest supermarket. First of all, bins are already present at candy routes, but are often not visible enough and therefore need to be made more visible. Possible ways to do this is by using bright colours, images or texts that attract the attention of youngsters. Prompting is another way to get the attention of youngsters and notifying them on how long it will take before they get to the next bin ("Just 100 metres!") is also a suitable strategy. A third strategy is 'routing' which is the use of visual cues in order to stimulate youngsters to walk a certain route (towards the bin). The use of footsteps shows what other people do and people often have a strong tendency to take an example from what other people are doing. (Novi Mores, 2014). It is Tessa de Been, NME-consultant 'Het Groene Wiel', who highlights the importance of collaborating with supermarkets in targeting the littering behaviour of youngsters, which can also be regarded as a point of action in reducing littering behaviour amongst youngsters[2].

Therefore, we recommend intervention makers to collaborate with important other stakeholders in the littering problem created by youngsters and to attract youngsters' attention through the use of bright colours, images of texts, prompts and routing.

The last environmental factor that influences littering behaviour is the presence of *penalties* for wrong behaviour and *rewards* for right behaviour. However, it is unsure whether this factor also holds true for youngsters littering behaviour, as we have only found it to be mentioned in literature about littering amongst all ages (Lyndhurst, 2013).

As Huffman, Grossnickle, Cope and Huffman (1995) indicate, psychologists have refrained from researching penalty strategies in the past, for either practical, ethical or legal reasons. No research has been found to see the effects of penalties on littering. A recent study on penalties for youngsters in general suggests that adult figures other than parents can influence behaviour because of their ability to sanction (Long, Harré & Atkinson, 2014). However, in the literature about penalties, punishments are often not seen as effective in deterring undesired behaviour. It is beyond the scope of this research to get into depth in this body of literature about the effectiveness of penalties. What we can state is that recent evidence shows that punishments on youth can be effective when trust and cooperation are key in the group climate (De Valk, Van der Helm, Beld, Schaftenaar, Kuiper and Stams, 2015). If this is not the case, punishment can have strong negative consequences (Ibid.). Punishments like corporal punishment, reprimands, suspension and fines do not show long term effects and focus on what not to do. Desirable alternative behaviours are not taught by penalties (Goldstein, 1999).

We are aware of the different functions punishments can have. In terms of effectiveness to reduce littering behaviour, this type of intervention is not recommended by us.

We do recommend intervention designers to make use of rewards when youngsters perform the right waste disposal behaviour. Research shows the positive effects of positive reinforcement

interventions (Huffman, Grossnickle, Cope & Huffman, 1995). Both monetary and non-monetary rewards can be effective, and can constitute for example toys or badges. Monetary rewards or discounts of merely one dollar had significant effects in reducing litter (Dwyer, Leeming, Cobern, Porter & Jackson, 1993). Individual incentives, rewards, or discounts have shown to be more effective than group rewards (Stead, McDermott, Broughton, Angus & Hastings, 2006). Examples of individual rewards are $1-coupons if bottles are returned, lottery systems for returned cans and coupons for using disposal bags in drive-in restaurants (Dwyer e.a., 1993). The authors of the abovementioned articles emphasize the limited durability of this type of interventions: the effects often last for as long as the reward is in place.

We therefore do recommend the use of incentives to change the littering behaviour of youngsters, though it should be used in combination with other strategies to establish a more lasting effect.

The importance of positive reinforcement is confirmed in the interviews. Jeptha Peijs, researcher and game designer at 'Ilsfontein', states that for unconscious behaviour, it is important that desirable behaviour makes people feel good. She notes that it is important that in the case that desired behaviour is performed, no negative consequences should be attached to that behaviour. "The aim should be to let people think: do it again, because it felt so good". Penninx notes that desired behaviour should be rewarded to create model behaviour. She also sees punishment of undesirable behaviour as an option[3]. This is in conflict with child and youth psychologist Marie-Anne Lamers' view, who explicitly argues for positive consequences instead of negative consequences. She explains that rewards can be monetary and need to be direct and easy to get[4].

Placing the environmental factors in the Ecological Systems Theory

The environmental factors discussed above can be viewed as residing in one of the layers of the Ecological Systems Theory. Some of them reside in one of the layers near the individual (e.g. amount of bins) and some of them reside in more distant layers (e.g. penalties). It is important to realize that the list of environmental factors influencing littering behaviour given in the previous paragraphs is not an exhaustive list, as many other factors can be distinguished that affect the environmental factors already mentioned. For example, national and local policy influence the amount of bins and the frequency of the emptying of public bins, which determines the fullness of bins. School policy determines the length of breaks and thus the amount of time youngsters can spend on travelling to the supermarket. We should thus not regard the factors as free-standing but interwoven into a web of other factors that interact with each other.

Targeting on the environmental factors...what to take into account?

- *Provide clean and pleasurable environment*
- *Give more attention to the bins!*

Back to Jasper

The extra bins placed next to the 'candyroute' has reduced the amount of litter next to the 'candyroute', however, Jasper and his friends still sometimes throw their garbage in the bushes. This is because these plain bins are often already full, produce an unpleasant smell and the bins itself also look dirty; not something Jasper wants to get close to. The NME decides to employ the municipality to make sure that the bins are emptied in time and cleaned to create a more pleasant smell and to make the bins shiny. Because the bins are very plain, the NME also has made them stand out more by using bright colours, pictures, a basketball net and prompting signs that say how far they are removed from the next bin and to help keeping the environment clean, and footsteps towards the bins. Moreover, for a week during the breaks the NME gives the youngsters who shoot straight for the basketball nets above the bins colourful sunglasses as a reward for not littering. Jasper and his friends now think it is fun and easy to throw away their trash and the next week they walk around with their new sunglasses, enjoying the litter-free 'candyroute'.

2.3. IMPORTANCE AND CHANGEABILITY ANALYSIS

We made a table in order to determine which determinants we consider are most promising to target when designing an intervention aimed at reducing the littering behaviour of youngsters. Table 1 shows the consultancy team's perception of the importance of every determinant, defined as the significant contribution of the determinant to the problem (littering). Furthermore, the table shows the perceived changeability, defined as the extent to which a determinant can be changed under influence of an intervention. We regarded 'intervention' as an activity that could be carried out by schools or external parties like NME. Determinants that could only be changed by interventions undertaken by governmental organs are considered not easy to change in our consideration. The interdisciplinary of the team, the intensive literature study and the multicultural composition of the team led to the outcome illustrated in Table 1. In this table, we demonstrate how important and changeable we considered each determinant, based on a one to three scale of importance and level of changeability.

TABLE 1: DETERMINANT'S PERCEIVED IMPORTANCE AND CHANGEABILITY

	Importance	*Changeability*
ATTITUDES		
Perceived effect of littering	●●●[a]	●●
Laziness	●●●	●
Belief that others will clean	●●	●●
Receptivity	●●●	●
Size of packaging	●	●
Perceived biodegradability/packaging	●●	●●
Inconvenience of keeping litter	●	●
Idea of getting caught	●	●
SUBJECTIVE NORM		
Peer influence	●●●(●)	●●
Type of company	●●●	●
Personal norms	●●●	●
Sense of Community	●●●	●●
Group size (3 people or 10 people)	●●	●
Crowding	●●●	●
Anonymity of environment	●	●
PERCEIVED BEHAVIORAL CONTROL		
Hurry	●	●
ENVIRONMENTAL FACTORS		
Existing litter level	●●●	●●●
Amount of bins	●●●	●
Distance to bin	●●●	●
Fullness of the bin	●●●	●
Characteristics of the bin	●●	●●●
Distance to nearest supermarket	●●	●
Penalties	●	●
Rewards	●●●	●●●

[a] ● Not very important/ Not easy to change; ●● Important/Changeable; ●●● Very important/Very easy to change

Table 1 illustrates that we assessed determinants in the attitudes category differently, ranging from not very important to very important. The changeability is generally seen as not very easy to change, with some determinants being changeable. We considered laziness and receptivity as very important influences on the behaviour, but also as very hard to change. Ways to overcome laziness and receptivity exist, especially in terms of environmental design and nudging. However, targeting these determinants themselves (making youngsters less lazy and more receptive) we considered as very hard to do. What seems promising to target are the perceived effects of littering, the beliefs that others will clean the litter and the perceived biodegradability of the packaging. These determinants are considered important or very important, and all are considered as changeable. Interventions described in paragraph 1.2.2 show effective strategies to influence the determinants, thereby influencing attitudes.

As can be seen in the table, the section about subjective norms seems conflicting. We perceive the importance of most determinants in this category as high, whereas the changeability is considered in all cases low. Peer pressure we perceived as being very important especially, based on the literature described above and the interviews with the experts. This age category is especially sensitive to this kind of influence. Therefore, the changeability can be considered low because youngsters may be hard to be persuaded since they place their norms in their group. Peers opinion (especially the closest friend) are matters for them.

The determinant found for perceived behavioural control – 'hurry' – seems not very important to us, nor very easy to change. More promising are several environmental factors. The existing litter level came up from the literature as being very important in determining youngsters' littering behaviour.
This determinant can easily be targeted: simply cleaning up the routes frequently can lead to less accumulation of litter and less littering behaviour. Furthermore, we consider the characteristic (attractiveness) of the bin as important, mainly based on the expert interviews. Multiple experts stated that youngsters need to be activated, that their enthusiasm should be tapped into. We consider this factor not only as important, but also as easy to change and therefore as highly promising. We therefore argue and recommend that future research should look into what constitutes attractive bins for youngsters. Another interesting determinant for interventions is the distance to the nearest supermarket. We considered this determinant to be important in contributing to the problem. Although this determinant is very hard to change, we do think some strategies could be used to minimize the effect of this determinant. For example, supermarkets very close to the school, maybe even in the school or just beside the school yard, would solve the problem of the candy route. A large and cheap offer and adjustment of supply in school canteens could help to reduce littering outside of the schoolyard. It should be noted that being outside and walking to the supermarket could be part of the decision to buy something in a supermarket. If this is the case, a larger assortment within the school may be less effective.

The last determinant that seems promising to us is providing youngsters with rewards if they dispose their waste properly. This can be done either monetary or non-monetary. We see great possibilities in this option, especially in the non-monetary rewards. Both tangible (e.g. scholarships) and social nonmonetary incentives (e.g. being mentioned in the school newspaper, praises from teachers) we consider likely to have beneficial effects on youngsters' behaviour (Tshube, Akpata & Irwin, 2012). A meta-analysis on reward showed that verbal praise accounts for enhancing the intrinsic motivation (Cameron & Pierce, 1994) We have not looked into the exact effects of specific types of rewards. We recommend further research on the effectiveness of different types of rewards that are within the possibilities of intervention designers or schools to provide. Compared to rewards, we think of penalties as less desirable. As argued in the paragraph on external factors influencing behaviour we consider penalties less effective, difficult to enforce and not focused on alternatives for behaviour.

[1] Authors' interview on June 15, 2015 with Toon Cillessen, Chair of Developmental Psychology at Radboud University Nijmegen
[2] Authors' interview on June 11, 2015 with Tessa de Been, NME-consultant 'Het Groene Wiel'
[3] Authors' interview on June 12, 2015 with Lotte Penninx, Child and youth psychologist
[4] Authors' interview on June 12, 2015 June with Marie-Anne Lamers, Child and youth psychologist

[5] Authors' interview on June 15, 2015 with Jeptha Peijs, Researcher and game designer at 'IJsfontein'

[6] Authors' interview on June 15, 2015 with Tessa Lansu, Assistant professor Developmental and Psychogerontology at Radboud University Nijmegen

[7] Authors' interview on June 12, 2015 with Henk Staat, Professor in Environmental behaviour at Leiden University

[8] Authors' interview on June 15, 2015 with Maarten Jacobs, environmental psychoiogist at Wageningen University

3. CONCLUSIONS AND ADVICE

In this report a theoretical approach using the Theory of Planned Behaviour (TPB) was used to analyse the determinants of littering behaviour amongst youngsters. A total of 24 of these determinants were identified, subdivided into 3 different components of the TPB: attitude, subjective norm, perceived behavioural control with the added category of environmental factors, using the Environmental Systems Theory (EST). The determinants provide insights into why youngsters are amongst the biggest polluters. After weighing the importance and changeability of the found determinants, we discovered that peer-influence acts as the most important determinant of littering behaviour of youngsters. In addition, laziness, perceived effect of littering, receptivity, personal norms, sense of community, type of company, crowding, existing litter level, the amount/proximity/fullness of the bins, and rewards are also considered as important determinants. However, based on the changeability analysis, we conclude that only environmental factors (existing litter level and characteristic of the bins) are the easiest changeable determinants. Furthermore, we have found effective strategies based on previous interventions that guided us to construct our recommendation. Supported by consultation with experts, below we present ingredients for effective interventions to interfere on littering behaviour of youngsters (12-18 years old).

Based on the results presented in this report, we give five main recommendations to intervene in the littering behaviour of youngsters

First, we advise to ***attract youngsters' attention***. Helpful tools to meet this advice are to make use of clear and short messages conveying information about not to litter. Connecting to youngsters' life views as well as to their interests and tap into their enthusiasm will not only help to understand the needs of the target itself but also gives insight into their world view and their line of thinking towards littering. Through making use of bright colours, images of text, prompting and routing, using communication channels with the greatest chance of exposure and effect (internet, social media) as well as using a combination of prompts (visual and verbal) instead of just one type of prompt have been found to be effective in catching youngsters' attention.

Secondly, ***targeting youngsters' beliefs about the effects of littering*** can benefit a rethinking of present or former littering behaviour and stimulate a change towards non-littering. This can be achieved by making youngsters aware of the effects of littering on the environment as well as on their direct surroundings. Also providing information or visualize the bio-degradability of litter can be complementary to address youngsters' beliefs.

Thirdly, we recommend to ***make use of youngsters' social surroundings***. Targeting peer groups instead of individuals, generating the norm not to litter in groups and making this visible, establishing group commitment, and making use of the influence of an existing leader in a group all provide a way to address the social surroundings of youngsters.

Fourth, we advise to ***reward proper waste disposal behaviour.*** By providing reward on the performed desired behaviour through either monetary or social nonmonetary rewards or initiating lotteries and competitions incentives are provided to youngsters to act in the aspired way.

Fifth and finally, we recommend to ***facilitate proper waste disposal behaviour instead of aiming to change youngsters***. This can be done through providing enough disposal possibilities (empty bins). Avoiding an accumulation of litter has been found to be a successful pre-condition as 'Litter leads to more litter'. Keeping away smells from areas where litter easily accumulates and making sure bins

and their surroundings are clean and easy accessible, can further contribute to a reduction in littering. This recommendation underscores the importance of collaborating with other stakeholders (e.g. municipalities) to ensure that these conditions for youngsters' behavioural change are present.
However, targeting these conditions cannot be done by intervention makers that this report was written for (NME). To make interventions more effective, we also suggest NME to combine these strategies in an intervention.

4. LIMITATIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

One limitation that we came across during our research is that the TPB that we used for our theoretical framework does explain behaviour, but does not focus on emotional elements such as perception (Gurung, 2013). The question that arises from this issue for further research is to find whether it is important to incorporate emotional elements into interventions aimed at the reduction of littering behaviour.

Another aspect that may have to be noted is the development of the brain of youngsters, which is, according to literature and conducted interviews, still developing. Because of this fact we should consider that it can be difficult to influence youngsters' behaviours. We therefore recommend researching these aspects of youngsters in order to find out more in detail how littering behaviour amongst youngsters can be influenced.

Due to the fact that a large part of our research is based on literature review and expert interviews, there is a potential for biases in our findings. One of the reasons is that literature primarily reveals information on effective interventions. To measure whether our advices are effective, we recommend further research to verify it to the target group and explore more about their context since different settings and characteristics apply.

We have tried to base all our results on literature aimed specifically at youngsters. However, in some cases, information has also been extracted from literature aimed at all ages or even only adults. We are aware that youngsters cannot be compared fully to adults, due to their brains being still in a developmental phase. However, Bob Mulder, lecturer Strategic Communication at Wageningen University, mentioned that the comparison between youngsters and adults should not be seen as too problematic, as youngsters do have many responsibilities similar to adults already (personal communication).

A more specific recommendation, what also came forward from our research is that there is not much information to be found on what constitutes attractive bins for youngsters and how littering behaviour is influenced by the characteristics of these bins. We recommend that further research is done on this subject.

Another recommendation for further research is to look into the exact effects of specific types of rewards as an intervention strategy, as we did not incorporate this into our research. This further research could look into the effectiveness of different types of rewards that are within the possibilities of intervention designers or schools to provide.

5. GLOSSARY

Attitude: positive or negative evaluation of performing a particular behaviour (Ajzen, 1991).

Behavioural intentions: a person's perceived likelihood or "subjective probability that he or she will engage in a given behavior" (Committee on Communication for Behavior Change in the 21st Century, 2002, p. 31).

Belief: cognitions about the world – subjective probabilities that an object has a particular attribute or that an action will lead to a particular outcome (Fishbein & Ajzen, 1974).

Communication channel: the techniques used to deliver components of interventions (Bartholomew et al, 2006).

Descriptive norm: a presumption of what is typical or normal based on what most people do ("If everyone is doing it, it must be a sensible thing to do.") (Cialdini, Reno & Kallgren, 1990).

Environmental factors: all factors residing outside an individual that influence one's behaviour.

Injunctive Norm: rules or beliefs as to what constitutes morally approved and disapproved conduct (Cialdini, Reno & Kallgren, 1990).

Intervention: an action in which a person becomes involved in a particular issue, problem etc. in order to influence what happens (Oxford Dictionary, 2008).

Litter: small pieces of trash which have ended up outside of a trash can (Hoppe, Bressers, Bruijn & Franco-Garcia, 2013)

Littering: making a place or area untidy with rubbish (Oxford Dictionary, 2008).

Nudging: method defined by Richard Thaler and Cass Sunstein to influence and change the behaviour of humans without the use of prohibitions and commands.

Passive littering: the act when someone drops litter that occurs when there is a latency between the placement of litter and vacation of the area (Sibley & Liu, 2003).

Active littering: the act when someone drops litter and continues walking (Sibley & Liu, 2003).

Perceived behavioural control (PBC): a person's ability to perform a behaviour with either ease of difficulty (O'Keefe, 2002).

Prompting: an act of encouraging someone to take a course of action (Oxford Dictionary, 2008).

Pro-environmental behaviour: conscious actions taken by an individual so as to minimize the negative impact of human activities on the environment or to improve the environment (Kollmuss and Agyeman, 2002).

Receptivity: the extent to which a person is willing to consider or accept interventions.

Social norms: behavioural rules that are perceived to be acceptable within a group

Subjective norm: the perceived social pressure to perform or not to perform the behaviour (Ajzen, 1991).

Theory of Planned Behaviour (TPB): a theory based on the assumption that behaviour is influenced by the following four components: attitude, subjective norms, perceived behavioural control and intention (0'Keefe, 2002).

Visual prompting: the act of encouraging someone to take a course of action through visible items**.**

Verbal prompting: an act of encouraging someone to take a course of action through lingual expressions.

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APPENDIX 1: INTERVIEWS

NYNKE SMINIA

Function: ***Nature and environmental researcher and consultant at Zaans Natuur en Milieu Centrum***
Date: ***14.06.2015***

1. Can you shortly describe what your function entails precisely?
I execute assignments, projects and events on the field of nature and environment for the municipality Zaanstad. Besides that I conduct research and give advice and in the field of nature and environment, as well as biodiversity and the Flora and Fauna Act. I also concentrate on creating awareness about nature and environment.

2. Which intervention strategies do you use to influence the behaviour of youngsters? What are important aspects of the behaviour of youngsters that are challenging to incorporate in these strategies?
Show effects of their behaviour in a fun way and let them think about it. Show the right and wanted behaviour. Improve facilities in public area. Image of specific behaviour and group pressure. Facilities in surroundings.

3. How do you proceed with designing a new intervention in which you try to influence the behaviour of youngsters?
Start to explore new developments and 'hot' topics or materials on the subject. Focus on only one or two messages you want to transmit. Bring it in an easy and fun way.

4. Which characteristics of interventions do you find important to use for these new methods? What do you think are factors that can contribute to effective intervention? Can you explain what this is based upon? Can you give examples of this?
An intervention has to be clear, so not to much messages at once which you try to transmit in a fun and 'up to date' way. Is based on experience, people (children, youngsters as well as adults) only remember a few (lets say, maximum of 3) messages or experiences of an activity. So ensure that you focus on the message you want them to remember.

5. What has been done in the field to change littering behaviour of youngsters?
A flyer was created in which al kinds of fun activities to do with groups according to the subject can be found. These activities are executed by different types of organisations like NME, schools, social work, sports clubs etc.

6. Do you also evaluate the outcome of these intervention methods? If so, how do you measure this?
Yes, but only based on the received reactions of the participants, parents and teachers.
Whether a change of behaviour actually occurs is unknown.

TESSA DE BEEN

Function: *NME-consultant 'Het Groene Wiel'*
Date: *11.06.2015*

1. What does your function entail precisely?

- Local center for environmental education
- Het Groene Weil assigned by the municipality to reduce littering by youngsters locally (candy route between supermarket and secondary school)
- Municipality of Wageningen monitors mage quality of Wageningen (pictures)
- Tessa tries to connect to Pantarijn secondary school in Wageningen but the scchool is not yet willing to cooperate fully (tried to find out what do they do already, ask students what they think about littering), the work with the school which has been done so far was rather an exception, most of the centres work focuses on primary schools
- Work with primary schools: assessing of their work with nature education, lessons for children in the centre and outside (forest etc…), teaching material provided to primary schools
- Tessa designed env. educational material for primary schools which is now used all over NL
- He centre helps the municipality with other projects as well (e.g. climate, water, garbage in general)
- The aim of the municipality is to stop littering
- Yet Tessa's focus is not precisely on education on the topic of littering (the centre only educates on knowledge about environment)
- Tessa: "education has to be part of it, of the intervention"
- Tessa has talked to the police in Wageningen, she is not in favour of penalties by the police but she thinks it is good to get the police as well to talk to the pupils in the school to talk about the effect of littering
- Tessa has had interviews with 6 pupils from the secondary school

2. In which ways do you try to influence the behaviour of youngsters? How do you proceed with designing a new method in which you try to influence the behaviour of youngsters?

- Tessa: for a successful intervention "I think they have to get involved. I think it even starts with getting a heart for nature. I think you really have to openly talk to them and really see what they think about it. … About philosophy, regulations and not coming with the rules, so that they formulate their own rules how nature or streets should look like. If they see how they want to see what their environment should look like than they can also formulate how they can cooperate. That is about awareness. We should also teach them about the effect. The scholars (students) themselves they said it would be good to shock scholars (students), so they have to see the problem in the big picture but also in the local picture."

"To create interventions on youngsters you will have to look at the problem also from inside the school"

"I think it is good to get the supermarket to cooperate as well and the neighbouring civilians." "You see a lot of projects with pimping garbage bins and I don't really think it can be part of it but a lot of times it is the main focus to pimp garbage bins and I think that scholars (students) know about the existence of garbage bins, so I don't think it is really effective but it is easy as a project and for publicity"

- starting point for interventions:
- Other interventions for secondary schools Tessa was reading about on the internet:

a) Role model (get the popular students, teach them, others will follow their behaviour), b) Police intervention / hands on /nudging (making students pick up of litter to enhance awareness BUT police intervention is assessed by Tessa's colleagues as not successful since it is assumed that youngsters will still litter when police is not present), YET Tessa argues police can be helpful to create rules for the youngsters, in her opinion youngsters need rules)

c) Environmental education
d) Theory of routine actions (especially on energy saving): breaking the routine action
- Pupils (n = 6) themselves suggest penalties and shock therapy
- There is no general rule for creating interventions within the centre. It depends on time, municipality officer, whether they really want to address the problem or if they want to show that they are busy with the problem
- The centres approach/ starting point: talk to teachers and students to know what they already know about the subject, then formulate the learning goal, brainstorming about how to get the students to understand the subject

3. Do you also evaluate the outcome of these methods? If so, how do you do this?
- Tests with students are implemented after env. education to find out what they have learned/ remember; following that interviews are implemented for evaluation (evaluation is done on their knowledge about the students)
- The centre has implemented a long term research on awareness of children and their attitude following a nature week, the outcomes have been compared to schools which did not implement a Nature Week; outcome: change of attitude towards nature of children which participated in the Nature Week (it takes too much time to monitor the awareness)
- Littering survey for pupils about how they think about litter (yet unsuccessful because it depends on the teachers to hand out surveys to pupils and hand it back)

TESSA LANSU

Function: ***Assistant professor in the field of Developmental and Psychogerontology at the Radboud University of Nijmegen***
Date: ***15.06.2015***

1. What are the best ways to influence youngsters?
- Meet the goals and the motives of youngsters
- Have connection with these existing goals and motives
- Be clear on our objective/goal (what the intervention wants to achieve)
- Stimulate different path of youngsters to influence them

2. We are now specifically in littering behaviour amongst youngsters, what do you suggest?
- There are probably multiple reasons for that. One thing is peer influence or modelling the other peers
- She suggest to contact people from communication science who got a grant for a project targeted at eating behaviour amongst adolescents (Monique Buijce and Kris Bevelander)

3. Which other elements in life of youngsters are important to influence them?
- There are multiple factors on influence processes.
- Characteristic of influence is one thing that is important such as status of the influencer. For example, people with high status will be followed more easily, people with high popularity, etc.
- Characteristic of the people being influenced is also important. For example: People with low self-esteem are more likely to follow other people.
- Group norms (descriptive norm). For example: power influence, high status.

4. How to influence descriptive norm?
- For example, making information that address other young people also done the same behaviour like "86% of youngsters always dispose their trash in the bin". Making this means setting a standard and thus influence youngsters to form group that engage in this standard.

5. How to even more effective to influence?
- Other than the social norm or social influence, pay attention on environment or the situation.
- Clean environment can have influence on behaviour, for example.

6. Any other suggestion on how to influence?
- Setting a goal is important. Like, how you are going to achieve it and social psychologist will be really helpful for answering that.

7. How to best address youngsters, individually or group?
- You can address in group but it is not necessarily on group intervention. You can also address it personally on individual level. For example, having a conversation with youngsters and talk about group norm.

MAARTEN JACOBS

Function: *Environmental Psychologist at Wageningen University*
Date: *15.06.2015*

Interview summary
There is not just one single intervention that can be implemented in order to change behaviour and the chance for success is better achieved through using a mixture of elements/strategies:
· Enabling existing behaviour/norms (youngsters know that littering is bad, it's already there but it needs to be enabled)
· Focus on individual attitude
· Focus on group level (peers) → most important with youngsters

Maybe it is feasible to look at how did littering behaviour change in the past? This shows that littering behaviour changed relatively rapidly and therefore it might also be relatively easy to change/facilitate.

Maarten states that believed control is not the most determining factor of littering behaviour. He sees littering behaviour as something that is not conscious because people do not reflect on littering as part of behaviour. However, this behaviour is also not entirely unconscious.

Maarten states that interventions on youngsters could be effective, but this depends on the intervention and whether it is permittable by society (death penalty for littering would work, but is not accepted by society)

Specific recommendations by Maarten:
· Communication often only focuses on increasing knowledge, but this is not a good strategy for changing behaviour
· It is important to capture the heart of people (like 'Bambi' did). You have to emotionally involve people
· Don't overestimate what you as a policy maker or single agent can do in order to change the behaviour of youngsters; you're just one voice with only little influence. It is complex and there are many factors that influence behaviour (change). It is important to lower our expectations on what we can achieve as a change.
· It is hard to project new norms on people because most people already have the non-littering norm (littering is bad)
· Focus on activating/enabling existing norms: Norm Activating Theory
· It is important for youngsters to understand the consequences of their behaviour and that they feel responsible.
· Focus on individuals and on groups together while also incorporating the community level

Littering is a matter of socialisation (becoming part of a culture). In this peers are probably most important socialising agents of youngsters. Other agents are parents, school and mass media. The ministry is not a socialising agent, unless it resonates with already existing norms

Keep in mind:
People (youngsters) give more emotional value to animals than to trees/landscapes. In order to change attitude it is important to also look at emotional value.

TOON CILLESSEN

Function: ***Director at Behavioural Science Institute, Chair of Developmental Psychology, Radboud University Nijmegen. Prof. Dr. at Radboud University Nijmegen.***
Date: ***15.06.2015***

1. What is your opinion about how to best influence the behaviour of youngsters?
Involving peers, including rewards, and explaining/clarifying the effects of behaviour.

2. What are specific aspects important to change youngster's environmental behaviour?
Show them what the effects of our behaviour on the environment are. Include peers as role models.

3. According to you, what is the best way to influence youngsters not to litter? (addressing TPB: attitude, subjective norm or perceived behavioural control, but also knowledge, self-perception, motivation, and other determinants)
Include peers or important others as role models for positive behaviour.

4. Do you think interventions on littering will be effective at this age? How can changes in behaviour
be realized at this specific age?
Yes, I think they can be effective. If you explain the (negative) effects of littering on nature, youths will be very sensitive to that.

5. How would you address youngsters in interventions (individually or groups)?
In groups or classrooms. Social media are also a good idea, for older adolescents.

6. What other elements are important to look at in life of youngsters, when thinking about influencing them? (school/teachers, hobby's, interests, activities, etc.)
The peer group is very important. Friends, classmates, and other important peers they hang out with.

JEPHTA PEIJS

Function: *Researcher and game designer at IJsfontein*
Date: *15.06.2015*

1. Wat houdt je werk precies in?
Ik ben onderzoeker bij de ijsfontein en gamedesigner. Dit houdt in dat als er een vraag binnenkomt van een opdrachtgever, ik begin met onderzoek naar hoe de doelgroep in elkaar zit, wat we weten over de gedragsverandering die we willen bewerkstelligen en wat weten we over de over zaken nu. Soms door middel van een literatuuronderzoek, soms een observatie, soms interviews en soms een expert die al een succesvol onderzoek heeft gedaan. Op basis daarvan gaan we een succesvolle interventie proberen te maken. We kijken dus naar wat wel en niet kan werken.

2. Komt dit altijd uit op een game als eindproduct?
Game is een specifiek woord, het is eigenlijk breder dan dat. Wat we maken zijn belevingen die zich richten op een digitale achtergrond. Dit kan een app, een site, een interactief billboard, maar ook een interactieve stoeptegel zijn. We noemen dit een game omdat we altijd opzoek zijn naar een spelende motivatie. We willen mensen prikkelen door een uitdaging of motivatie.

3. Blijkt zo'n 'game' het effectiefst te zijn om de gedragsverandering te bewerkstelligen?
Ja...(twijfelend), blijkt dat effectief te zijn? Dit is dezelfde vraag of kookboeken effectief zijn. Er zijn er heel veel, het is maar net wat je wilt. Je kunt niet zomaar zeggen: dat is bewezen effectief. In de literatuur staan verschillende resultaten. Wij kiezen hiervoor omdat we geloven dat mensen een natuurlijke nieuwsgierigheid hebben. Games prikkelen deze nieuwsgierigheid en daardoor krijgen mensen een open houding en nemen ze makkelijker informatie op. Of dit nou leren rekenen is of gedragsverandering op het gebied van straatvervuiling.

4. Richt u zich voornamelijk op jongeren en kinderen?
Ja, dat is een van onze specialisaties.

5. Wat is u visie op het verandering van het gedrag van jongeren? Hoe kun je dit het beste bereiken en wat zijn belangrijke aspecten?
Ik heb een blog geschreven over de tien beste manieren om jongeren te bereiken, misschien dat je daar naar kunt kijken. Jongeren zijn eigenlijk van zichzelf heel enthousiast, die hebben geen rem. Dat heeft ook te maken met de fase waarin je zit qua cognitieve ontwikkeling. Als je dit enthousiasme weet te prikkelen, zijn ze heel actief en betrokken en gaan ze als een speer. Specifiek op jullie onderwerp: Het groenste studentenhuis is een challenge geweest, maar als dat eenmaal loopt dan gaan ze dit ook echt met z'n allen doen.

6. Het is frappant dat u de ontwikkelingen die jongeren doorgaan niet ziet als een barrière voor gedragsverandering, zoals andere interviews dit ons lieten zien.
Ja, dat moet je juist gebruiken denk ik. Wat veel gedragsinterventies doen is een rationele aanpak (handen wassen in ziekenhuis, posters, speciale kranen, rationele stimuli om handen te wassen). Maar de reden waarom je het wel of niet doet is niet rationeel; ze zijn onbewust en gaan in het automatische gedeelte. Als je iets voor jongeren probeert te maken waar je ze met argumenten en kennis wilt stimuleren tot ander gedrag, dan heb je het heel zwaar. Bij hun komt nóg minder binnen dan bij andere mensen. Zij laten zich nog veel meer door intuïtief en onbewust gedrag leiden dan volwassenen. Je moet jongeren dus heel direct op het gedrag sturen. Je kunt bijvoorbeeld een app maken die info geeft over wat straatvervuiling doet, maar dat is een kennisding. Dat werkt niet bij jongeren. Je moet ze op het gedrag sturen, en dus eigenlijk een soort spelletje maken die inspeelt op

het gedrag. Als je bijvoorbeeld wil dat mensen minder peuken op de grond gooien is het een idee om een groot dartbord te maken waarop je die peuk moet gooien. Dat werk veel beter dan dat je op een
cognitief aspect in gaat spelen: Weet je wel hoe lang het duurt voordat dit afbreekt (vb)? Het eerste voorbeeld is een speelse oplossing en de tweede een niet-speelse oplossing. Bij jongeren is die speelse oplossing veel beter.

7. Waar zou een interventie op moeten focussen wanneer er gekeken wordt naar het gedrag rondom zwerfaval?
Wat werkt ligt aan verschillende typen jongeren wat mij betreft. Zeker op dit onderwerp heb je de mentalities en motivication. Dat is een manier om over doelgroepen na te denken zonder te kijken naar leeftijd en opleiding en inkomsten etc.. Bij mentality zeggen ze dat een doelgroep samenhangt op wat je waarden in het leven zijn, hoe je in het leven staat. Ik denk dat het afhangt van de soort jongeren die je probeert te bereiken met welke peilen je het meeste succes zult behalen. Je hebt bijvoorbeeld hele materialistisch georiënteerde jongeren. Aan het andere eind van het spectrum heb je hedonistische jongeren; die willen het leuk hebben om het moment zelf. Ook heb je nog jongeren die bezig zijn met wereld om zich heen. Ik denk dat heel nuttig is voor jullie project als je voor jezelf bedenkt wat het type jongere is waarop je je gaat richten, en op basis daarvan je theorie uit gaat stippelen.

8. Maakt u in uw interventies ook gebruik van het feit dat er meerdere typen jongeren zijn? En wat doet u daar dan mee; komen er meerdere interventies?
Een goed product moet voor al die jongeren iets hebben. Facebook is succesvol want het bedient meerdere type mensen (meekijkers, showers). Je kunt proberen één project te maken voor al deze type jongeren, maar wat wij meestal doen is vragen aan de opdrachtgever naar zijn ultieme droom en op basis daarvan selecteren we bepaalde groepen jongeren. Dus je beperkt de doelgroep maar dan word het wel effectiever. Wat voor jullie misschien een interessante theorie kan zijn is het persuasive by design model van Sander Hermsen en Reijn-Jan Renee. Het boek dat zij hebben geschreven heet: Ontwerpen voor gedragsverandering. Sander Hermsen is al 10 jaar bezig met dit onderwerp voor de Radboud Universiteit.

9. Wat is volgens u het verschil tussen interveniëren op bewust gedrag en op onbewust gedrag?
Ik denk dat bij onbewust gedrag je heel goed op moet letten dat het mensen een lekker gevoel geeft. Dat is iets wat vaak fout gaat. Het is bijvoorbeeld niet goed als je bij littering het goede gedrag vertoont maar toch nog extra info krijgt over slechte gevolgen. Het is de bedoeling dat je juist krijgt: Doe dat nog een keer, want dat voelde zo lekker. Als je die persoon wilt confronteren met kennis en info, moet je dit goed timen en moet je weten dat het gedrag ingesleten is als je de confrontatie aangaat. Bij bewust gedrag moet je oppassen dat je niet belerend bent. Als mensen zich openstellen om bewust gedrag te vertonen hebben ze zelf als allerlei ideeën over wat goed en niet goed is, en dan is het fijn dat een applicatie of een interventie deze goede ideeën bekrachtigd. Dit in plaats van dat er een gestuurd programma is waarbij je iemand aan de hand neemt (schools programma). Ze moeten zelf doelen kunnen stellen in plaats van dat er een doel opgelegd wordt. Het is belangrijk om aan te sluiten bij kennis er al is.

10. Kijkende naar deze leeftijd, zou je je richten op individuen of groepen?
Ik neig naar groepen in deze doelgroep en dit onderwerp. Maar wat het lastige is met groepen is dat je ook in de groep één iemand moet hebben die ermee begint en die je moet bereiken. In die zin wil je iets vinden voor dit onderwerp waar iemand zelf mee kan beginnen, zonder dat hij de hele groep hoeft te overtuigen. Pas als hij het zelf aan het doen is en diegene voelt zich daar goed bij, dat hij dan langzaam de groep erbij betrekt.

LOTTE PENNINX

Function: *Child and youth psychologist*
Date: *12.06.2015*

1. Wat is jouw visie op het beïnvloeden van het gedrag van jongeren?
In de pubertijd zijn kinderen in ontwikkeling, dus ik denk dat dit een ingewikkelde fase is om gedrag te veranderen. Jongeren zijn op deze leeftijd zoek naar eigen identiteit en eigen normen en waarden en autonomie. Het is lastig, maar wel mogelijk. Ik denk dat in deze fase peers een grotere rol gaan spelen.

2. Zijn er specifieke aspecten belangrijk bij het veranderen van gedrag?
Jongeren worden volwassen op deze leeftijd, dus je wilt ze deugdelijke normen en waarden bijbrengen. Je wilt dat duidelijk wordt wat hun wereldbeeld is, waar dat uit bestaat. Juist omdat ze zo gefocust zijn op zichzelf en egocentrisch kunnen zijn, omdat ze bezig zijn met wie ben ik/ waar sta ik/ wat wil ik, is het belangrijk dat ze van hun omgeving meekrijgen wat belangrijk is voor de maatschappij. Dit komt niet uit henzelf, dus is belangrijk om ze dat bij te brengen.

3. Denk dat je interventies bij deze leeftijd effectief zijn?
Ja, ligt eraan wat voor een interventies. Littering tegenaan bij deze doelgroep is wel ambitieus en lastig vermoed ik. Omdat naar mijn idee dat in die levensfase geen belangrijk dingen zijn, of juist belangrijk in de zin dat pubers zich willen afzetten tegen alles en iedereen. Dus dan is littering een middel om zich af te kunnen zetten en dit in hun gedrag te tonen door dingen op straat te gooien. Iets op de juiste manier weggooien, dus niet litteren, is voor hun in deze levensfase niet belangrijk genoeg. Voorbeeldgedrag is iets wat mij effectief lijkt. Bijvoorbeeld van peers. Daarin is het ook belangrijk om goed gedrag te belonen zodat op die manier voorbeeldgedrag ontstaat. Je zou ook nog kunnen denken aan het straffen van ongewenst gedrag. Bij interveniëren in educatie denk ik aan beelden weergegeven op een toffe snelle variant van wat afval is en wat er gebeurt als je het op straat gooit. Specifiek voor deze doelgroep moet het denk ik shockerend zijn of dik aangezet worden, voordat de boodschap binnenkomt.

4. Hoe zou jij het gedrag rondom zwerfafval bij jongeren veranderen? Dus in plaats van dat jongeren hun afval op straat gooien, leren om het in de prullenbak te gooien?
Ik denk dat het mogelijk is om littergedrag te veranderen, maar niet door verf op een prullenbak ofzo. Eerder door er een basketbalnetje omheen te hangen. Als het leuk wordt om het erin te gooien, als er een extra uitdaging bij komt kijken, dan is er een grotere kans dat jongeren het zullen gebruiken. Dan is het ook stoer om afval weg te gooien. Dan zijn jongeren niet bezig met het weggooien van afval maar bezig met het doen van een stoere worp en dat maakt het dan toffer voor zichzelf en vrienden.

5. Waar zou een interventie op moeten focussen wanneer er gekeken wordt naar het gedrag rondom zwerfaval?
Ik denk dat peers in deze leeftijdsfase van groot belang zijn. Vanuit de psychologie is het bekend dat in deze leeftijdsfase de verschuiving plaatsvindt dat kinderen geen voorbeeldgedrag van oudere mensen meer aannemen, maar dat ze het juist van hun peers gaan aannemen. Ze zetten zich af tegen ouders en leerkrachten. Dus dan zijn de peers erg belangrijk om op te richten. De hersenopmaak van jongeren houdt in dat ze geen of weinig besef van risico's en gevaren hebben, ze vertonen juist risicovol gedrag. Ik denk dat het belangrijk is om daar ook rekening mee te houden in interventies. Daarom zijn misschien shockende dingen ook weer niet het juiste middel omdat jongeren daar minder gevoelig voor zijn. In ieder geval: op welke manier dan ook, ze moeten minder met zichzelf bezig gaan maar met groepsbelangen.

6. Zou je je richten op individuen of groepen?
Groepen!

7. Zijn er nog andere factoren/elementen die belangrijk zijn om naar de kijken als het gaat om het beinvloeden van jongeren?
Ik denk dat het aanpassen van de indirect omgeving ook goed werkt. Het kan zeker effectief zijn als er op meerdere levensgebieden "normaal gedrag" voorgedaan wordt. Het is goed als het op meerdere plekken gebeurt en ze het daardoor belangrijk gaan vinden om afval te scheiden. Bijvoorbeeld zowel op de voetbalclub, als bij hun ouders thuis, als in de stad ergens. Hoe meer plekken hetzelfde belang hebben (afval in de prullenbak gooien) hoe normaler het wordt.

8. Wat zou je ons nog meegeven?
Ik denk dat gedragsverandering aantrekkelijk gemaakt kan worden door te kijken naar wat jongeren op die leeftijd boeiend vinden. Koppel het aan iets wat al interessant is, bijvoorbeeld een computerspel/game/social media ofzoiets. Een evenement met een band bijvoorbeeld. De jongeren komen dan voor de band, maar als ze daar regels krijgen voor het opruimen van afval dan zou dat hun normen en waarden misschien kunnen beïnvloedend. Je bent dan impliciet bezig met het belang waar het omgaat, maar je laat ze er wel mee in aanraking komen. Bijv. harde bierglazen inleveren op festivals.

Belangrijke kenmerken van deze doelgroep:
-Hersenen zijn in ontwikkeling
-Egocentrische houding
- Vanuit peers ipv ouders en leraren
Omdat ze egocentrisch zijn en op zoek zijn naar zichzelf is het belangrijk om aan te sluiten bij wat zij interessant vinden.

MARIE-ANNE LAMERS

Function: *Child and youth psychologist*
Date: *12.06.2015*

1. Wat is jouw visie op het beïnvloeden van het gedrag van jongeren?
Dat is best moeilijk, maar wel belangrijk. Het is moeilijk omdat jongeren in die leeftijdsfase bezig zijn om eigen keuzes te leren maken en identiteit te ontwikkelen, ze willen daarom zelf dingen bedenken. Maar qua hersenontwikkeling in die fase in het nadenken over gevolgen en het plannen van dingen nog niet zo fantastisch. Jongeren hebben het idee dat ze heel veel zelf willen en kunnen, maar daar zitten ontwikkelingstechnisch onmogelijkheden in. Zelf verantwoordelijkheid nemen voor gedrag is nog het zwakst ontwikkeld in de hersenopmaak. Belangrijk is denk ik "goed voorbeeld doet goed volgen" om gedrag te beïnvloeden. Het wordt waarschijnlijk niet 100% opgevolgd door jongeren, maar ik denk wel dat het kan helpen.

2. Zijn er specifieke aspecten belangrijk bij het veranderen van gedrag?
Ik denk dat het heel belangrijk is om een goed voorbeeld te geven. En het is belangrijk om het te faciliteren. Het is belangrijk om voorwaarden te scheppen die het makkelijk maken om te doen wat je wilt dat ze doen. Bijvoorbeeld als je als moeder wilt dat kinderen hun eigen was aanleveren: zorg dat er duidelijke wastonnen zijn. Dus mag litter niet op de grond? Denk na over wat het voor jongeren zo makkelijk mogelijk kan maken om het in de prullenbak te gooien. Dan is de kans groter dat ze gedrag aanpassen.

3. Denk dat je interventies bij deze leeftijd effectief zijn?
Dit is een moeilijk punt. Juist in deze leeftijd zijn jongeren niet zo gevoelig voor gevolgen en zeker niet voor lange termijn gevolgen. Jongeren leven in korte termijn gevolgen. De gevolgen of consequenties die je wilt laten zien moeten heel erg aansluiten bij de leefwereld van jongeren. Wat zijn daarin de belangrijkste ingrediënten: Leeftijdsgenoten (peers, wat vinden anderen ervan) is de belangrijkste marker. Daarin moet eenheid gecreëerd worden. En het moet gaan over positieve consequenties en niet negatieve consequenties. Die laatste komen niet binnen denk ik. Dus niet dreigen met: dan wordt de waterkwaliteit slecht en dan worden wij ziek. Maar het moet raken aan wat in hun leeftijdsfase belangrijk, maarja wat is dat dan…? Waar hou je je mee bezig in die leeftijdsfase? Misschien kun je kijken naar chillen/uitgaan/hangen. Misschien als het afdoet aan de kwaliteit daarvan, werkt het. Als er minder fatsoenlijke plekken zijn om te hangen vanwege de litter, dan komt het dichtbij henzelf en dan raakt het ze. Het is dus belangrijk om te kijken naar directe gevolgen voor de jongeren zelf als je wilt proberen dat ze er zich iets van aantrekken.

4. Hoe zou jij het gedrag rondom zwerfafval bij jongeren veranderen? Dus in plaats van dat jongeren hun afval op straat gooien, leren om het in de prullenbak te gooien?
Ook hier zou ik zeggen: Voorwaarden scheppen zoals prullenbakken etc. Het heel makkelijk maken om het ergens te kunnen laten. Belonen kan ook werken, er geld tegenover stellen. Als je iets koopt en de verpakking weggooit en je krijgt een kwartje terug, maar dan onmiddellijk, niet daar iets voor moeten doen. Als je het weggooit moet er meteen een kwartje uit de prullenbak komen. Ze zijn te lui om helemaal naar de Albert Heijn te moeten. Het moet onmiddellijk en makkelijk om iets te bewerkstelligen vanuit een interventie. Als iets lollig is kan het ook werken. Bijvoorbeeld als er muziek uit een prullenbak komt ofzo. Maar belonen met materieel werkt misschien beter.

5. Waar zou een interventie op moeten focussen wanneer er gekeken wordt naar het gedrag rondom zwerfaval?
Het sociale component is belangrijkst voor deze doelgroep. De peers.

6. Zou je je richten op individuen of groepen?
Ik zou in deze categorie zeker kijken naar groepen, juist omdat het functioneren in een groep belangrijk is. De beïnvloeding van gelijken, dat is bekend, werkt veel beter. Dus jongeren tegen jongeren in plaats van een ouder naar jongeren. Degene die de input levert qua toon/kleur/persoon/leeftijd/attitude moet dicht liggen bij de persoon die erover gaat. Elkaar erover laten leren, want in groepen zit ook sociale druk en sociale cohesie.

7. Zijn er nog andere factoren/elementen die belangrijk zijn om naar de kijken als het gaat om het beinvloeden van jongeren?
Het is belangrijk dat er eenduidigheid bestaat. Dan blijft het in stand, anders niet. Als jongeren het op 1 plek wel mogen litteren en op een andere plek niet, dan werkt het niet. Dit geldt voor gedragsverandering in het algemeen. Iets moet unaniem en overal hetzelfde aangestuurd worden. Dan is de kans het grootste dat het gaat bestendigen. Als papa en mama hetzelfde vinden heb je kans dat een kind het doet, als papa het anders vindt dan mama wordt het al onzekerder. Qua motiveren werkt het dus niet als dingen niet eenduidig zijn. Als er op verschillende plekken eenduidige normen bestaan is dat het meest effectief.

Other things:
Het zou kunnen dat men/de opdrachtgever in jullie geval, verwachtingen moet bijstellen over het kunnen veranderen van het gedrag van jongeren. De verwachtingen moeten niet te hoog gesteld worden. Want deels kunnen jongeren er niks aan doen dat ze zich gedragen zoals ze doen. Ze moeten plannen en leren plannen, maar je bent op die leeftijd nog niet genoeg ontwikkeld dat je het ook echt kunt. De Frontale Cortex is er nog niet klaar ervoor. Belangrijk om hier rekening mee te houden.

HENK STAATS

Function: *Professor of Environmental Behaviour at Leiden University*
Date: *12.06.2015*

1. What is in your opinion the best way to influence youngsters?
- Group influences because peer pressure is very effective
- Create influences in the target physical environment/ environmental context
- In terms of littering, it is effective to let the youngsters clean the area themselves
>this creates descriptive norms about what the area should look like
>this intervention can be time consuming but has been done in several places with success

2. In your opinion, can be interventions implemented on youngsters/adolescents effective? Or how can effective interventions on this target group be created?
- Addressing youngsters in groups is the most effective way
- Try to target the "most likeable" of the group and try to get them on "your side"
- Provide feedback to youngsters about their behaviour
>make clear their behaviour is costly in terms of cleaning the environment
>make clear to them the environmental damage that is caused by littering

3. What are your recommendations on unconscious mechanisms?
- Norms entailed in peer pressure
>create the norms at leading people within groups

4. How to best address youngsters, group or individually?
- Group!

5. Which other elements in life of youngsters are important?
- Teacher's > very much depends on relationship with pupils (teacher must be likeable amongst the target group to be able to influence them)