Is it how we tell them about alcohol? The role of presentation formats in health education materials for lower educated students

Zebregs, S.

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Simon Zebregs
University of Amsterdam
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The Amsterdam School of Communication Research, Department of Communication, University of Amsterdam, PO Box 15791, 1001 NG Amsterdam, The Netherlands
Is it how we tell them about alcohol?
The role of presentation formats in health education materials for lower educated students

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Faculteit der Maatschappij- en Gedragswetenschappen
Voor mijn moeder
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Chapter 1: Introduction, summary of findings, and discussion

Introduction

In the Netherlands, adolescents from lower secondary education levels are more likely to engage in unhealthy risk behaviors than adolescents from higher education levels. Low-educated adolescents also begin to do so at an earlier age (Schrijvers & Schuit, 2010). This includes underage alcohol abuse. For example, Dutch pre-vocational students who consumed alcohol during the past month were about five times more likely to be a binge drinker than students from pre-university schools (De Looze et al., 2014). Similarly, adolescents enrolled in pre-vocational schools and special education schools are found to be more likely than students from pre-university and senior general secondary education schools to engage in weekly heavy drinking (Kepper, Monshouwer, Van Dorselaer, & Vollebergh, 2012). These statistics suggest that low-educated students are more in need of prevention interventions than students from higher levels.

The Dutch government perceives health education materials to be an important component of an overall prevention approach (Van Rijn, 2013). In the Dutch context, these materials have been developed for the general population of secondary education students (Cuijpers, Jonkers, De Weert, & De Jong, 2002). However, low-educated students generally possess less cognitive capacities than students from higher education levels, which is likely to influence the effectiveness of health education materials negatively (Van Dijk & Tellegen, 2004). According to the limited capacity model of communication (Lang, 2000), the availability of fewer cognitive capacities may impact negatively on information encoding and storage processes. The encoding and storage process together determine how information in health education materials is processed. Both processes require the availability of sufficient cognitive capacities (Lang, 2000). This means that low-educated students are likely to experience more difficulties with processing information (Hunt, 2005). Therefore, it is especially important for this target group that materials are developed in a way that facilitates information processing in a most optimal manner.

One factor that is suggested to influence information processing is the format in which information is presented (e.g., Green, 2008, Land, 2009). Three often-studied formats that may impact on the effectiveness of health education
materials for low educated students are the informational, narrative, and statistical formats (e.g., De Wit, Das, & Vet, 2008; McQueen, Kreuter, Kalesan, & Alcaraz, 2011). The existing literature proposes various likely mechanisms of action for these formats that explain how these could increase the effectiveness of health education materials. However, their influence on the effects of health education materials have never been examined amongst low educated adolescents. Instead, most previous studies have focused on college students, who can be expected to have significantly more cognitive capacities (Hunt, 2005; Van Dijk & Tellegen, 2004). Due to the variation between these claims and a lack of research amongst low educated adolescents, it remains unknown how presentation formats influence health education materials effectiveness within this group. The aim of this dissertation is therefore to examine how presentation formats can be used to make health education materials for low educated students as effective as possible. This will be done through the following research question:

What is the influence of presentation formats on the effectiveness of health education materials for low educated students?

The three types of presentation formats

Traditionally health education texts are presented in an informational format (Kreuter et al., 2007). This format presents facts and ideas that help to explain the core message of a text. Information unrelated to the core message of a text is typically excluded (Land, 2009). In health education materials for students from low education levels informative texts could be written as the example below:

When you drink alcohol, it makes you feel different. You can become happier. When drinking alcohol you also may dare more. Then you can start to do risky things. However, due to the alcohol, your control over your physical movements will decrease. This makes you more likely to fall down.

In contrast, narratives are cohesive stories describing a setting and episode from the perspective of one or more protagonists, often providing information about goals, plans, actions, and outcomes (Kopfman, Smith, Ah Yun, & Hodges, 1998). In the context of health education materials, narratives describe the same consequences of drinking alcohol as would be provided in informational texts, but incorporate those in a story about one or more characters who experience the consequences. The narrative format can be applied in several ways, most often either as a replacement of informational text or in the form of a testimonial
added to illustrate an informational text (Kreuter et al., 2007). A narrative could for instance replace the example text of the informational format above in the following way:

Patrick, Lisa, and Angelo are sitting on a bench in the park. Patrick brought some cans of beer and asks: “Who wants a beer?” Lisa responds: “I do!” She is curious. Angelo does not respond at all. He doesn’t want to drink alcohol. Lisa opens a can and takes a few sips. Patrick immediately finishes a whole can. Then he takes another one, and another one. He starts to feel different. The alcohol makes him feel happy. Patrick also dares to do more risky things. He climbs on one of the other benches and walks on the edge of the back. Due to the alcohol Patrick has less control over his movements. He loses his balance and falls on the ground. He stands up and says to the others: “Let’s go home.”

An example of a testimonial illustrating the informational text above would be:

Hi, my name is Wesley. Last week I went to a party where I drank beer. After a few beers I thought it was funny to climb on a shed. Due to the alcohol I felt really good and I walked on the edge of the roof. Then I stumbled and fell down of the roof. I fell really hard and my leg was very painful. In the hospital they told me my leg was broken. Now I will not be able to play football for months.

The third category is statistical evidence, or base-rate information as it is commonly referred to in literature. Statistical evidence summarizes quantitative information on a large number of cases and can be generalized across a population. It is different from other presentation formats by providing insights into the likelihood that certain consequences will occur after drinking alcohol (Allen & Preiss, 1997). Statistical evidence is typically used in combination with one of the other presentation formats to support claims based on data from a large number of cases. Because low educated students may have difficulties understanding statistics, this could, for example, be applied in the following way:

Questions have been asked to 1000 students who occasionally drink alcohol. The questions concerned their experiences with alcohol. A number of them responded that they have been involved in an accident after consuming alcohol. This was most often because they acted
The advantages of each presentation format

As I have mentioned above, while the informational format is most frequently used, alternatives could be applied in two ways: by replacing the informational format with the narrative format or by adding testimonials or statistical evidence to texts written in the informational format. The existing literature offers various claims about the advantages of one format over others, which I review next.

When comparing the informational format with the narrative format, the debate centers on their different effects on knowledge, and persuasion-related outcome variables such as attitude. According to some accounts, informational texts could provide an advantage over narratives regarding their effects on knowledge, because narratives may have a seductive details effect that would reduce their effectiveness (Land, 2009; Land, Sanders, & Van den Bergh, 2008). The seductive details hypothesis suggests that narratives contain interesting but irrelevant details, such as information about characters. This information may distract the attention from important information and decrease the amount of important information that is remembered (Garner, Gillingham, & White, 1989; Mayer, 2002), which is particularly relevant for the target group of this dissertation that has limited cognitive capacities (Hunt, 2005).

On the other hand, scholars have expressed strong beliefs about the superiority of narratives over other formats, including the informational format (e.g., Kreuter et al., 2007; Murphy, Frank, Chatterjee, & Baezconde-Garbanati, 2013). Narratives are considered to increase understanding by making abstract concepts more concrete (Green, 2008). People are thought to be familiar and comfortable with processing narratives, because storytelling is the primary way in which people share social information and experiences. Most people do this since childhood without receiving any training or having special knowledge (Kreuter et al., 2010). Moreover, narratives are suggested to allow for vicarious learning, which means that people can learn from examples in the narrative about how to perform a behavior and what its outcomes will be, without engaging in the behavior themselves. This way, they may come to believe they are also capable to perform a behavior (Bandura, 2001). Narratives are also suggested to trigger a state of engagement (often referred to as transportation) that cannot be established.
through other presentation formats. In such a state, people are less inclined to engage in critical processing, making people more likely to be persuaded (Green & Brock, 2000). Finally, narratives trigger more affective responses, which may influence determinants of behavior like affective attitude and intention (Kopelman et al., 1998).

Regarding the possibility to add either testimonials or statistical evidence to informational texts, there are again claims in favor of both options. The potential advantages of using the narrative format have been discussed above and also apply to testimonials according to the literature (Kreuter et al., 2007). Statistical evidence may provide an advantage for persuasion by forming a strong argument that a behavior is very likely to result in particular outcomes. If the outcomes described are experienced by a considerable number of people, then it is suggested to be more difficult for individuals to deny that they could experience similar outcomes (Baesler & Burgoon, 1994). As such, they will be more likely to accept that the claims about possible consequences apply to themselves and to change their beliefs accordingly.

**Aim of this dissertation**

As stated in the introductory paragraph, the aim of this dissertation is to examine how presentation formats can be used to develop health education materials for low educated students that are as effective as possible. This is done using existing health education materials of the Trimbos Institute’s “Healthy school and drugs” program, which is the most commonly used health education program at Dutch secondary education schools. Before the start of the studies included in this dissertation, the texts of the existing materials have been adapted to the reading skills of low educated students. These materials are written in the informational format.

Three strategies to apply presentation formats are explored that potentially make health education materials more effective. The first strategy is replacing texts written in the informational format with narratives. The second and third strategies are adding testimonials or statistical evidence to informational texts. Effectiveness is examined through three outcome variables: knowledge about negative consequences of drinking alcohol, attitude towards alcohol, and intention to drink alcohol. The first two outcome variables are selected because the applied materials are designed to educate students about the negative consequences of drinking alcohol, with the aim to have students consider these consequences and adjust their attitude accordingly (Trimbos Institute, 2012). Intention to drink
alcohol is included as a third outcome variable, because attitude is an immediate predictor of behavioral intention that is in turn a proximal determinant of behavior (Fishbein & Cappella, 2006).

**Structure of this dissertation**

This dissertation takes an cumulative approach in that the first study forms a starting point and decisions for each subsequent study are based on the outcomes of the preceding ones (see Table 1.1 for an overview). Each decision is also made within the feasibility boundaries of research conducted at lower education level schools. In particular, conducting research in special education schools make it impractical to run studies with more than three conditions, as the limited number of students in these schools place a constrain on achievable sample sizes. For this reason it is impossible to conduct an experiment with a design that tests all possible formats simultaneously. Instead smaller studies are conducted to test formats that appear most relevant based on insights available at the study design stage.

**Table 1.1**

*Overview of chapters*

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**Summary of findings**

To answer the research question of this dissertation, I have first examined whether there is a difference in effects of materials that are completely written in a narrative format and materials written in an informational format (chapter 2). Results show that both types of materials have an immediate effect in a healthy direction on knowledge and attitude that disappears over time. However,
no differences are found between conditions. No effects are found on intention to drink alcohol. Hence, it is concluded that both types of materials are equally effective.

The next possibility that is explored is adding texts in other presentation formats to informational texts. There are two strategies that I compare for this purpose: adding narrative evidence (testimonials) and adding statistical evidence. I first have conducted a meta-analysis to gain insights into the findings of previous studies that have compared these strategies (chapter 3). Results show that statistical evidence has a stronger influence on the cognition-related variables beliefs and attitude. Narrative evidence has a stronger influence on behavioral intention, which for many behaviors is found to be stronger driven by affect in previous research (Keer, Van den Putte, & Neijens, 2010). However, the differences between both formats regarding their effects on attitude and intention are found to be only marginally significant.

The studies included in the meta-analysis have mainly been conducted amongst college students. The findings for these highly educated samples may possibly not apply to low educated students. Therefore, it is important to compare the formats in an experiment amongst the target group of this dissertation. However, the findings of the meta-analysis for intention are explained through research that examined the influence of affective and cognitive attitudes on intention. Based on these findings I have argued that narratives are considered to trigger more affective responses and that this may explain why narrative evidence is found to have a marginally stronger effect on intention than statistical evidence. Like most of the studies that compare statistical and narrative evidence, the research examining the influence of affective and cognitive attitude on intention is conducted amongst college students (Keer et al., 2010). As such, the fit between the samples of these studies appears to be good, but the findings of previous research on the influence of affective and cognitive attitude on intention may not apply to my research population. Such relations are likely to differ across behaviors and populations (Fishbein & Cappella, 2006). Therefore, the next important step has been to examine the relation between affective attitude, cognitive attitude, and intention within my target population and for my target behavior (chapter 4), to make more accurate predictions regarding the effects of statistical and narrative evidence on behavioral intention that could be expected in a subsequent experimental study.

The results of a cross-sectional study show that only affective attitude has a positive relation with intention to drink alcohol, whereas cognitive attitude is
found to be unrelated to intention. Based on these findings, narrative evidence can be expected to have a stronger effect on behavioral intention than statistical evidence in an experiment setting (chapter 5). This experiment, however, does not show any differences in effects between the conditions. The experimental data does show that a considerable proportion of participants already has much knowledge, unfavorable attitudes towards alcohol, and little intention to drink alcohol. Given these sample characteristics, it is necessary to account for differences in opportunity for change between participants. Ignoring these influences may erroneously lead to the interpretation of no effects within the overall sample. Such a lack of effects may, however, only characterize participants with little opportunity for change, who already have much knowledge, unfavorable attitudes towards alcohol, and little intention to drink alcohol, while participants with much opportunity for change may actually be influenced by these formats. Therefore, analyses distinguished between students with much and little opportunity for change in a healthy direction. In this, effects the have only been expected amongst the students with much opportunity for change. Results show that both materials with statistical evidence and materials with narrative evidence have equally strong healthy effects amongst students who have much opportunity for change in a healthy direction on knowledge, and affective and cognitive attitude. The knowledge effect disappears over time. No effects are found for intention to drink alcohol for both groups.

The previous two experiments have provided important insights into the effects of various information formats in health education materials for low educated students. However, neither of these experiments has included a control group that is not exposed to any materials. Based on these studies, one cannot rule out the possibility that the changes noted after the experimental manipulation are actually the result of paying attention to the topic of alcohol through the pre-measurement questionnaire. Paying attention to this topic may have activated existing beliefs and knowledge in memory, which may, as a result, have become more accessible in memory. When knowledge becomes more accessible, it will be easier for participants to write down negative consequences of drinking alcohol (Klimesch, 1994; Radvansky, 2011). Similarly, when beliefs become more accessible these will have a stronger influence on attitudes and intention (Fishbein & Yzer, 2003). As a result, knowledge, attitudes, and intention to drink alcohol may have changed between waves due to the attention for topic of alcohol. If such changes occur, these may lead to the incorrect conclusion that materials are effective while the change is caused by the questionnaire. Therefore, an additional experiment with two conditions (informative texts without testimonials added versus informative texts with testimonials added) and a no expo-
sure control group is conducted (chapter 6). This study shows effects on affective and cognitive attitude in a healthy direction amongst students who have much opportunity for change. However, a similar effect is found in the control group with an equal strength. Therefore, the effects on affective and cognitive attitude appear to be questionnaire effects and cannot be attributed to the materials. The results also show that informational materials with and without testimonials have an equally strong positive effect on knowledge amongst students with much opportunity for change in a healthy direction. No significant change in knowledge has been found in the control group amongst students with much opportunity for change. Hence, these effects can be attributed to the materials.

Based on the findings of the experiments it can be concluded that only the effects on knowledge about the negative consequences of drinking alcohol can be attributed to the materials, but that there are no differences between the direct effects of formats. Methodological literature recommends that in such cases it is still valuable to examine whether materials have an effect on the mechanisms that are suggested to account for the direct effects if these would have been found (Hayes, 2009; Mackinnon, Kull, & Lockwood, 2000). These authors argue that there may be other mechanisms that have not been considered and have an effect in the opposite direction of the mechanisms that are considered. The unconsidered mechanisms would then suppress the effect of the mechanisms that are considered, making it impossible to observe any direct effects (Hayes, 2009; Mackinnon et al., 2000).

For the studies in this dissertation such effects can be examined through secondary analyses of the data from the three experiments. In this, it is only possible to focus on effects on knowledge, because effects on persuasion-related outcome variables could not be attributed to the materials. Furthermore, the experiments conducted for this dissertation all focused on suggested advantages of the narrative format. Most of the theoretical suggestions in the introduction about the effects of narratives are about effects on persuasion-related outcome variables and cannot be applied for knowledge effects. Narratives may, nevertheless, also provide an advantage for effects on knowledge by making abstract concepts more concrete through the stimulation of imagery of the things that are described in the text. The effect of the narrative format through imagery on knowledge is therefore the focus of the final chapter of this dissertation.

In the studies of this dissertation the narrative format is applied in two ways, as a replacement of informational texts or as testimonials that are added to informational texts. The difference between these two strategies is that in the testi-
monial strategy the information is repeated, whereas in the replacement strategy all information is only presented in the narrative texts. This introduces the factor repetition that should be considered, because it may also have an effect on imagery. When information is repeated students have more opportunity to retrieve images from memory of past experiences in which they have encountered the negative consequences of drinking alcohol. As such, imagery may also increase when information is repeated, regardless of whether this repetition is established through a narrative format. Hence, the effects of the testimonials strategy can be expected to be stronger than the effects of the replacement strategy, the effect of testimonials on imagery might partly be caused by the use of a narrative format and partly by repetition of information.

The narrative format is found to have a significant positive effect on imagery, both for the comparison between materials containing texts fully written as a narrative with text written in the informational format, and the comparison between informational texts with and without testimonials added as narrative evidence. The effect of the latter comparison is found to be significantly stronger than the effect of the former comparison. The difference is marginally significant for the comparison between statistical and narrative evidence, which suggests that the effect of adding testimonials to informational texts is mainly accounted for by repetition of information. Imagery has both a direct influence as well as an indirect positive influence through perceived interestingness of materials on the allocation of cognitive capacities to process the information in materials. In turn, the allocation of cognitive capacities has a positive influence on knowledge. The overall indirect effect of the experimental manipulations on knowledge is very small, but significant, for the two experiments in which the effect of the manipulation on imagery is significant. It is only marginally significant for the experiment that compares statistical evidence with testimonials. The final conclusion is therefore that the use of the narrative format in health education materials for low educated adolescents can have a very small positive effect on knowledge through its ability to stimulate imagery.

**Scientific implications**

The findings of this dissertation have implications that should be considered for future research. In the introduction I have discussed the strong beliefs about the efficacy of the narrative format that exist amongst scientists (e.g., Kreuter et al., 2007; Murphy et al., 2013). Nevertheless, there appears to be no empirical support for these claims. In this dissertation I only found a small indirect effect of the narrative format on knowledge, but no major effect differences between pre-
sentation formats. This lack of large effect differences is in line with the empirical findings of previous research comparing presentation formats (e.g., Lemal & Van den Bulck, 2010; Murphy et al., 2015). The findings of this dissertation and previous studies suggest that there is a lack of evidence to support the claim that the effect of narratives is much stronger than the effect of other formats. This does not imply that narratives cannot have knowledge and persuasive effects, but only that effects are not much stronger than the effects of other formats. Although multiple studies have found narratives to provide an advantage over other formats, a closer examination of effect sizes shows that these effects are most often very small (e.g., Kim, Bigman, Leader, Lerman, & Cappella, 2012; Murphy et al., 2013). For example, a study comparing narrative and non-narrative videos found the narrative video to have a significantly stronger effect on knowledge, attitude change, and behavior. These effects were nevertheless very small, meaning the value of eta squared did not exceed .03 (Murphy et al., 2013).

Moreover, there are multiple reports of null-findings for comparisons of effects on persuasive outcome variables between the narrative and informational format (e.g., Lemal & Van den Bulck, 2010; Moyer-Gusé & Nabi, 2011). Similarly, a recent meta-analysis comparing narratives with other formats shows only very small effects, including an overall correlation of .06 (Shen, Sheer, & Li, 2015). These small effects may be found only with very large samples and cannot be considered as strong supporting evidence for the major effects that are claimed.

Given the lack of effects that can be attributed to health education materials in the experiments, it remains remarkable that the narrative format is not found to result in stronger persuasive effect than materials written in other formats or a no exposure control group. As I have mentioned before, claims about the strong persuasive effects of narratives are dominant in the existing literature (e.g., Kreuter et al., 2007; Murphy et al., 2013). These claims are based on theory about the persuasive effects of narratives in an entertainment context (e.g., Green & Brock, 2000; Slater & Rouner, 2002). In general such theory suggests that people can get absorbed into a narrative and consequently are not inclined to engage in critical processing. This would make them more likely to accept beliefs that are included in the narrative as being true, making narratives very persuasive (e.g., Niederdeppe, Heley, & Barry, 2015; Murphy et al., 2015). The results of this dissertation, however, do not suggest that such effects have occurred in the conditions where the narrative format is applied.

A possible explanation for the lack of such effects may be found in the extended elaboration likelihood model, which suggests that people may only get absorbed into a narrative when they process this narrative with the goal to get enter-
tained (Slater & Rouner, 2002). This notion is not commonly discussed in the literature, but is potentially very important to consider. Within the context of this dissertation it may have been unlikely that participants have had the goal to get entertained while being exposed to educational materials, because they are students in a school context. Due to this context, it may have been unlikely that the absorption mechanism would be activated, through which narrative are supposed to provide persuasive advantages. This notion may also explain the lack of large effect differences in the other studies described above, because typically presentation formats are compared in a context where it is unlikely that people have the goal to get entertained (e.g., Kim et al., 2012; Murphy et al., 2013).

Murphy and colleagues (2015), for example, have compared the effects of narrative and non-narrative cervical cancer-related videos and have only found small difference between conditions. These videos had an informative nature instead of an entertaining nature. This is illustrated by one of the main characters of the narrative video sharing important facts when the story unfolds. Given this nature of the videos, participants may not have had the goal to get entertained, which may have influenced the results. It is, therefore, an important aspect to consider in future studies, which should pay more attention to the context of the experimental manipulation.

In addition to reviewing the theoretical literature about the persuasive effects of formats, the introduction of this dissertation also included two suggestions about format effects on knowledge. On the one hand, narratives are suggested to provide an advantage by making abstract concepts more concrete, because people can better imagine the content of the text (Bower & Morrow, 1990; Shioda, 1993). On the other hand, informational texts are suggested to provide an advantage over narratives, because narratives may include interesting but irrelevant details. These details may distract students’ attention from the important information and, as a result, decrease effects on knowledge (Land, 2009; Land et al., 2008). In this dissertation the distraction effect is not found. Such an effect would have been most likely to occur in the experiment that is presented in chapter 2, in which the effects of a booklet fully written in an informative format are compared to the effects of a booklet fully written in a narrative format. The narratives in this experiment are however written in such a way that the important information takes a prominent position in the plot of the narrative. This information may therefore have been too prominent to be distracted from by other details. This is different from previous research that did find a distraction effect, in which the important information appears to have been less prominent (Land, 2009).
In the other experiments, all conditions contain informative texts in which the important information is provided without irrelevant details. Although additional texts in other formats are added to these informative texts, distraction by irrelevant details is unlikely to occur within these conditions, because the relevant information is clearly presented in the informative texts. Based on this reasoning, it is important for researchers to consider how clearly the important information of texts is presented to determine whether or not they can expect irrelevant details to have a distracting effect.

Some evidence is found in support for the suggestion that narratives make abstract concepts more concrete by stimulating imagery. Repeating information, however, appears to have a stronger influence on imagery than the effect that can be attributed to the narrative format. This effect is suggested to occur because repetition may provide adolescents with the opportunity to activate images of previous encountered experiences from memory without the need for the detailed description that is provided in a narrative (Lang, 2000). Based on this assumption the effect of repetition on imagery is likely to be bounded by the availability of relevant images of previous encountered experiences in memory. This availability of relevant images may differ across behaviors, as adolescents are more or less likely to encounter specific behaviors. Alcohol abuse is relatively common in our society and adolescents most likely have encountered situations where they have seen its negative consequences. This may have happened both directly in real life and indirectly, for example, by seeing it on television. The images from such experiences are stored in memory and can become activated when adolescents are exposed to health education materials (Klimesch, 1994; Radvansky, 2011). However, for other topics, like the use of a substance like LSD, adolescents may not have images of previous experiences available in memory. As such, repetition may not have a similar effect on imagery, which suggests that this effect is bounded by the availability of images of previous experiences in memory. In situations where availability is limited the effect of narratives on imagery may be stronger, because adolescents cannot use their own memories. This reasoning suggests that it is important for future studies to focus on the interaction between repetition of information, the use of a narrative format, and the availability of visual images of previous experiences in memory.

Finally, this dissertation clearly illustrated the need for studies to include a control group that is not exposed to any materials. The findings of the dissertation for attitudes show that results of studies without a control group can lead to incorrect conclusions. Based on the findings of the first two experiments, which did not include a control group, it could be concluded that all materials have an
equally strong effect. However, based on the final experiment that did include a control group, it needs to be concluded that the changes in attitudes cannot be attributed to the materials. Instead the attention paid to the topic appears to have caused this change, by activating existing negative beliefs about drinking alcohol (Ajzen, 2001). Therefore, it is important to include a control group, because it is otherwise impossible to determine to what extent effects can be attributed to materials. This is an urgent concern given the fact that most studies reported in the literature have not included a control group (e.g., Jansen, Van Osch, De Vries, & Lechner, 2013; McQueen et al., 2011).

**Practical implications**

The findings of this dissertation have several implications for the application and development of health education materials for preventing alcohol abuse amongst students from the lower Dutch secondary education levels. The results of the studies in this dissertation show that health education materials only account for effects on knowledge. Hence, the health education materials tested in this dissertation should only be applied to educate students about the negative consequences of drinking alcohol. These effects do however also fade within a month after exposure. This suggests that a single exposure is therefore not sufficient to maintain effects over time and repeated exposures are required. All materials examined prove to be effective in establishing immediate effects on knowledge about the negative consequences of drinking alcohol. However, secondary data analyses in the final chapter reveal that these effects are slightly stronger for materials that stimulate imagery better. This effect occurred through an increase of interest in the materials and an increase of focus on the materials. The stimulation of imagery can both be established through the use of a narrative format and the repetition of information. As both these factors are included in the strategy in which testimonials are added to informative texts, this strategy has resulted in the strongest effect on imagery.

A major advantage of the finding that all materials can have an effect on knowledge is that the various materials can be used to establish the repetition that appears to be required for establishing knowledge effects that last over time. Multiple booklets could be developed using different formats. This way, students could be exposed to the same information on multiple occasions without exposing them to the same booklet multiple times. Repeated exposure to the same information in the same format is likely to decrease people’s appreciation of the message, which is likely to decrease the effectiveness of materials. This is called a wear-out effect. Changing the presentation format in materials is suggested to
solve this issue (Tellis, 1997). Hence, repeating the same information through booklets written in various formats may prevent this wear-out effect and increase the effectiveness of health education programs.

Such a strategy may nevertheless be too expensive to put into practice, meaning that it is only possible to develop one booklet. If so, then a choice for the most promising presentation format or combination of formats should be made. Based on the findings in chapter 7 of this dissertation, the combination of informational texts with testimonials appears to be most promising. This combination has the strongest effect on imagery, which is partly caused by the use of a narrative format and partly caused by the repetition of information. Through imagery there is a positive effect on students’ interest in the booklets, more cognitive effort invested in processing the booklets, and eventually more knowledge about the negative consequences of drinking alcohol. Hence, the combination of informational texts with testimonials is the most promising choice in a situation where it is only possible to produce one version of a booklet.

There appears to be limited use to apply the existing materials for establishing effects on attitudes or intention. No effects are found for intention, while the effects found on affective and cognitive attitude also occur in a control group without exposure to materials. The effects for attitudes suggest that it is sufficient to pay attention to the health topic for these effects to occur and health education materials are not required. These effects are most likely the result of the activation of existing beliefs, which have become more accessible in memory (Ajzen, 2001). To establish a healthy effect, this requires people to have existing negative beliefs about alcohol. In a context where the target group does not yet have such negative beliefs about a health behavior, it may still be advisable to use health education materials in an attempt to have the target group form negative beliefs, because it will then be impossible to establish desirable effects through the activation of negative beliefs.

Although no effects of health education materials are found for outcome variables related to persuasion (i.e., attitudes and behavioral intention), the final implication concerns the use of a narrative format to decrease resistance to persuasion. Some authors have proposed that the use of the narrative format would lead to engagement with the story and, as a result, to less critical processing (e.g., Niederdeppe et al., 2015). As such, the narrative format would trigger less resistance than other formats. The results in this dissertation do not support this assumption. As shown in the discussion section of chapter 2, the level of critical processing is found equally high for booklets written in a narrative format and
booklets written in an informational format. These findings could be explained through the extended elaboration likelihood model (Slater & Rouner, 2002), which suggests that the increase of engagement may occur only when people process a narrative with the goal to get entertained. Only then the decrease of critical processing may occur, because people with this goal will not be motivated to have a critical stance. Narratives are related to the goal to get entertained, because people often consume narratives for this purpose. However, it is not the format that determines the processing goal, but other factors like the context and a person’s mindset. For example, statistical evidence is frequently used in entertainment television shows like quizzes. People may under such circumstances also have the goal to get entertained and not engage in critical processing. At school, students are more likely to have a goal to get informed and are unlikely to change their processing goal from getting informed to getting entertained based on the fact that information is presented as a narrative instead of an informational text. Hence, the effect of narratives decreasing critical processing is not applicable to school health education materials and should not be expected by professionals in the field. If resistance is to be avoided, then other contexts where the target group can be reached while they have a goal to get entertained should be considered.

**Conclusion**

This dissertation shows that health education materials for low educated students can primarily be expected to have an immediate effect on students’ knowledge about the negative consequences of drinking alcohol. With a single exposure this effects disappears over time. Presentation formats can only be expected to have a minor influence on this effect, through the higher levels of imagery that are established by using the narrative format. Researchers should start to consider moderators of effect differences between formats. For persuasion-related effects this concerns the role of people’s processing goal and for knowledge effects the interaction between repetition of information, the use of a narrative format, and the availability of visual images of previous experiences in memory. Developers of health education materials should not expect presentation formats to have a major influence on the goals they try to achieve. However, they should consider that the effectiveness of all presentation formats offers the opportunity to establish repetition without exposing students to the same materials multiple times.
References


Chapter 1


Chapter 1


