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Tobacco Cessation

Smoking Education for Low-Educated Adolescents: Comparing Print and Audiovisual Messages

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This study aims to provide insight into which modality is most effective for educating low-educated adolescents about smoking. It compares the persuasive effects of print and audiovisual smoking education materials. We conducted a field experiment with two conditions (print vs. video) and three measurement times (Time 1, Time 2, and Time 3). A total of 221 high school students in the second year of the lowest levels of education in the Netherlands participated at all three time points of the study. Results showed that participants in both conditions had more negative beliefs about smoking after being exposed to the smoking education than before, but there were no differences between the print and video version in this effect. However, the video version did make the attitude toward smoking more negative at Time 3 compared to baseline, whereas the text version did not, which suggests that the video version was more effective for educating low-educated adolescents about smoking.

Keywords: tobacco prevention; school-based health promotion; low-educated adolescents; modality

► INTRODUCTION

In the past decades, the prevalence of smoking in Western countries has decreased, which reduces the risk of several major health threats like cancer, pulmonary disease, and cardiovascular disease (World Health

Organization, 2012). However, the decline in smoking has not been uniform in all socioeconomic subgroups of the population. The prevalence of smoking over the past decades declined substantially more in people with a higher education and income than in people with a lower education and income, thus widening the gap between different social groups (Giskes et al., 2005; Kanjilal et al., 2006). This disparity in smoking between low- and high-educated groups is already manifest among adolescents. In the Netherlands for instance, 15.4% of adolescents in the lowest level of secondary school smoke daily, whereas only 0.9% of adolescents in the highest level smoke daily (Van

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Dorsselaer et al., 2010). Therefore, it is important to specifically target low-educated groups in health education efforts to decrease the prevalence of smoking and thus reduce the health threats of smoking for those most at risk.

To prevent adolescents from smoking, many secondary schools provide their students with smoking education (Cuijpers, Jonkers, De Weerd, & De Jong, 2002; Gottfredson & Wilson, 2003). However, little research has addressed the factors that make smoking education effective specifically for low-educated adolescents. Most research about school-based smoking education programs has participants from higher school levels (see Dobbins, DeCorby, Manske, & Goldblatt, 2008; Wiehe, Garrison, Christakis, Ebel, & Rivara, 2005). An adaptation of educational materials that may be efficient for lower educated groups is to replace written text with video clips in which the text is spoken by an actor. This is easily implementable and could ease the processing burden for low-educated adolescents. Audiovisual presentation likely frees up cognitive capacity for comprehension of the message, especially for groups who have difficulty reading, because they do not have to decipher the written words (Wilson & Wolf, 2009). Print and video represent different modalities or channels through which information is presented to recipients (Moreno, 2006). The present study compares these two modalities to gain insight into which modality is most effective for low-educated adolescents. This study provides a link between research and practice by providing insight into the effectiveness of different modalities for low-educated adolescents, which can be applied by health promotion and education practitioners. In this way, the study contributes to the development and evaluation of health promotion programs.

► LITERATURE REVIEW

To our knowledge, there is no prior research that specifically tests the effectiveness of different modalities of smoking education materials for low-educated adolescents. However, a few studies that compared printed and audiovisual health messages have included groups with different disparities that are likely related to a low education level, like low literacy. These groups are expected to be similar in that they have difficulty reading. These studies have shown mixed results. For instance, Meade, McKinney, and Barnas (1994) showed that there was no difference in the recall of printed and videotaped materials about colon cancer among low-literate patients of a health clinic. However, Campbell, Goldman, Boccia,

and Skinner (2004) found that a simple text version of information about informed consent for medical tests was recalled better than a video that narrated the text. In contrast, Wilson et al. (2010) showed that participants with limited health literacy, a characteristic that is also related to a low-education level (Paasche-Orlow, Parker, Gazmararian, Nielsen-Bohlman, & Rudd, 2005), recalled information about inhaler use better when they had seen a video that narrated and illustrated the use of an inhaler than when they had read a print version with the same text and images (Wilson et al., 2010). In sum, mixed results have been found in studies about modality effects of health messages that included adult participants with characteristics similar to low-educated adolescents.

Some studies have tested the modality of health education interventions among adolescents with higher education levels. For instance, Corston and Colman (1997) compared a print version of a health warning to an audiovisual version in which an actor spoke the text directly into the camera, a so-called talking head presentation. Their results indicated that the print message was better recalled than the audiovisual message. Byrne and Curtis (2000) extended this research by including multiple audiovisual versions. In addition to an audiovisual talking head presentation, they used a version with the same spoken text accompanied by message-relevant images, and a version with the spoken text accompanied by message-irrelevant images. Their results showed that all audiovisual versions resulted in less recall of the health warning than printed text. Thus, for higher educated adolescents, printed versions were more effective than audiovisual versions. However, low-educated adolescents may be more similar to low-literate adults, for whom mixed results were found. Therefore, it is unclear whether printed or audiovisual messages are more effective for low-educated adolescents.

In addition, these studies focused on recall of health messages. However, smoking education is not primarily aimed at recall but rather at influencing determinants of smoking behavior (Cuijpers et al., 2002). The theory of reasoned action (Ajzen & Fishbein, 2005) posits that beliefs about the consequences of a behavior, attitudes, or evaluations about a behavior, and intentions to carry out a behavior, influence the performance of the behavior. Based on the theory of reasoned action, we study the effects of the modality of smoking education on the beliefs, attitudes, and intentions toward smoking. To date, we have not been able to retrieve studies about effects of modality on beliefs, attitudes, or intentions that include participants who show similarities to low-educated adolescents. Therefore, we formulate the following research question (RQ)

with respect to the effect of modality on behavioral determinants:

RQ1: What is the effect of the modality (print vs. video) of smoking education messages on beliefs, attitudes, and intentions toward smoking of low-educated adolescents?

If the modality of smoking education messages has effects on low-educated adolescents' beliefs, attitudes, and intentions, these could be explained by differences in message processing (Chaiken & Eagly, 1976; Corston & Colman, 1997). In the elaboration likelihood model (Petty & Cacioppo, 1986), persuasion is determined by the type of processing that a recipient of a message engages in. A recipient can either process the message deeply and generate thoughts about the message or process the message more superficially and base his or her reaction on easily discernible cues. In the latter type of processing, a variable that may play a role is appreciation. Appreciation refers to a positive attitude toward the message (Brown & Stayman, 1992). Because video is more vivid than print, it is likely appreciated more (Taylor & Thompson, 1982). Appreciation can serve as a positive cue, which can lead to increased effectiveness of the message (see Brown & Stayman, 1992). Therefore, we expect that for our target group, message appreciation can also influence the effects of smoking education, reflected in the following RQ:

RQ2: What is the role of appreciation in the effect of the modality (print vs. video) of smoking education messages on beliefs, attitudes, and intentions toward smoking of low-educated adolescents?

In the elaboration likelihood model, deep processing is impeded by distraction. Several researchers have suggested that video is more distracting than print, because features of the presentation can draw attention away from the content of the message (Byrne & Curtis, 2000; Corston & Colman, 1997). For instance, visual cues like the appearance and the nonverbal behavior of a spokesperson can distract from what the spokesperson is saying. When recipients are distracted, processing of the message is likely impaired, which can result in decreased effectiveness (Corston & Colman, 1997). On the other hand, it is possible that the audiovisual modality can initially attract viewers' attention to the message and enhance processing (Taylor & Thompson, 1982). This could lead to higher effectiveness of the message. Therefore, we ask the following:

RQ3: What is the role of distraction in the effect of the modality (print vs. video) of smoking education messages on beliefs, attitudes, and intentions toward smoking of low-educated adolescents?

► METHOD

Participants

Participants were high school students in the second year of the lowest levels of education in the Netherlands: practical schools, which are aimed at preparing students for a low-skilled job (*Praktijkonderwijs* [Practical Education], PrO), and prevocational schools, in which classes were selected in which most students received additional support to obtain a diploma (*Leerwegondersteunend Onderwijs* [Supported Education], LWOO). For students to get selected for this type of education, they have to meet several criteria. First, students at PrO should have an IQ score between 60 and 75 (Rijksoverheid, n.d.-a). At LWOO, students should have an IQ score between 75 and 90 (Rijksoverheid, n.d.-b). Second, for both types of education, students should be behind multiple years in primary school skills, such as reading and mathematics (Rijksoverheid, n.d.-a, n.d.-b). In PrO schools, classes are small (approximately 10 students) to be able to provide more attention to the students.

At the first time point of data collection, 111 students from 11 classes of 8 PrO schools participated. In addition, 168 students from 10 LWOO classes of 5 schools participated. Of these students, 93 PrO students (dropout of 16.2%) and 149 LWOO students (dropout of 11.3%) participated at the second time of data collection. At the third time of data collection, 86 PrO students who had completed the prior two times also completed the final questionnaire (total dropout since Time 1 of 22.5%) as well as 135 LWOO students (total dropout of 19.6%). The main reason students dropped out after Time 1 was that they were not at school when one of the questionnaires was administered, mostly because they were ill or absent. Dropouts did not differ from the students who remained in the sample on gender, $\chi^2(1) = .49, p = .55$, or age, $t(273) = .74, p = .46$. However, dropouts did smoke more cigarettes in the past month at T1, $t(269) = 2.52, p < .05$.

In the final total sample of 221 PrO and LWOO students, there were 126 boys (57%) and 93 girls (43%). The average age was 14 years and 8 months with a range from 13 to 16. 12.6% of PrO students and 12.8% of LWOO students had smoked in the month prior to T1. They smoked an average of 3.7 cigarettes on 7.3 days in the previous month.

Materials

Smoking education materials were constructed in two versions. A printed version was based on existing materials from the “Healthy School and Drugs” education program, produced by the Dutch Trimbos Institute, the national institute for mental health and addiction. This program is used in 75% of Dutch secondary schools (Malmberg et al., 2014). The materials contained short texts that mainly focused on the consequences of smoking, such as damaging your lungs and becoming less fit. A comparable audiovisual version was made by a professional film producer. An actor stood in front of a school yard where children were walking around. The actor spoke the exact same text as in the printed version, giving a “talking head” presentation. This was important to make differences between the versions other than modality as small as possible, to be able to confidently attribute found effects to the modality of the material. In this way, the versions were completely equivalent on the information that was given in both modalities (see Appendices A and B).

Participants in both conditions received a booklet with exercises, like writing down all words that they associated with smoking. This was done because these exercises were part of the Trimbos’ materials. By ensuring the materials were similar to existing smoking education materials, ecological validity was increased. The booklets and video were unavailable to the students and teachers after the study session in which they were exposed to them. In this way, the possibility of contamination was minimized.

Procedure

The study was conducted in a classroom setting. A researcher instructed the students that they should complete the questionnaire individually and that their answers would be handled anonymously. In total, the same students answered the questionnaires at three time points. The questionnaire at Time 1 took approximately 20 minutes to complete. Approximately 4 weeks later, at Time 2, classes were randomly assigned to either read the print version or watch the audiovisual version. The audiovisual version was shown to the class as a whole on a screen in front of the class, and the print version was read by each student individually, though in the classroom setting. Both the researcher and a teacher of the students were present during the whole procedure. They reminded students to pay attention if they did not. If students (occasionally) talked with each other they were told not to. After exposure, participants again completed a questionnaire. Taken together, this took 30 to 40 minutes. The procedure at

Time 3, which took place approximately 4 weeks after Time 2, was similar to Time 1. There was no difference between the conditions with regard to gender, $\chi^2(1) = .46, p = .50$, or age, $t(219) = 1.34, p = .19$. Also, participants in both conditions smoked equal numbers of cigarettes in the past month, $t(217) = .38, p = .71$. This indicates that randomization was successful. At the school level, there was no difference between the conditions with regard to school type, $\chi^2(1) = .37, p = .58$.

Before participation, a passive consent procedure was followed. Two to 4 weeks before the study, parents received a letter explaining the topic and goal of the study. They could indicate that they did not consent to their child participating in the study by handing in a signed form. In that case, the child was not allowed to participate in the study. This procedure was approved by the ethical review board of the Amsterdam School of Communication Research (ASCoR) at the University of Amsterdam.

Measures

As outcome variables, beliefs, attitudes, and intentions toward smoking were measured. Beliefs were measured by six items about expectancies of negative consequences of smoking that were addressed in the education materials, such as “If I smoked, my lungs would be damaged.” These items were based on the ones used by Lochbuehler, Sargent, Scholte, Pieters, and Engels (2012). These items were answered on a 4-point scale ranging from *no, not at all* to *yes, very much* (Cronbach’s α T1 = .80; T2 = .76; T3 = .88; T1: $M = 3.25, SD = 0.68$; T2: $M = 3.41, SD = 0.61$; T3: $M = 3.29, SD = 0.81$). Items for attitudes and intentions were based on Ajzen (2006). Attitudes were measured by seven semantic differentials following the stem “If I smoked, I would find it.” These were completed by 4-point scales (e.g., *very negative* to *very positive*, Cronbach’s α T1 = .88; T2 = .92; T3 = .94; T1: $M = 1.38, SD = .55$; T2: $M = 1.34, SD = 0.56$; T3: $M = 1.33, SD = 0.58$). Intentions were measured by three items, such as “Are you planning to smoke?” which could be answered on a 4-point scale ranging from *no, certainly not* to *yes, certainly* (Cronbach’s α T1 = .96; T2 = .96; T3 = .95; T1: $M = 1.33, SD = .62$; T2: $M = 1.33, SD = 0.64$; T3: $M = 1.32, SD = 0.68$).

As processing measures, appreciation and distraction were measured. Appreciation was measured at Time 2 with three items, such as “I liked the lesson,” which were answered on a 4-point scale ranging from *no, not at all* to *yes, very much* (Cronbach’s $\alpha = .80$; $M = 2.65, SD = .82$). Distraction was measured with two items based on Byrne and Curtis (2000), such as “During the lesson, I was distracted,” which were

TABLE 1
Means and Standard Deviations of Beliefs, Attitudes,
and Intentions Toward Smoking by Condition

Outcome	Print	Video
Beliefs T1	3.23 (0.72) ^a	3.25 (0.65) ^a
Beliefs T2	3.39 (0.63) ^b	3.43 (0.59) ^b
Beliefs T3	3.22 (0.87) ^a	3.35 (0.75) ^a
Attitude T1	1.36 (0.56)	1.41 (0.54) ^a
Attitude T2	1.30 (0.49)	1.38 (0.62) ^{ab}
Attitude T3	1.41 (0.67)	1.26 (0.46) ^b
Intention T1	1.30 (0.61)	1.33 (0.58)
Intention T2	1.26 (0.60)	1.39 (0.68)
Intention T3	1.34 (0.75)	1.30 (0.61)

NOTE: $N = 221$. Different superscripts indicate a significant difference within the column. T1 = Time 1; T2 = Time 2; T3 = Time 3.

answered on a similar scale (Pearson's $r = .81$; $M = 1.72$, $SD = .88$). In addition, we measured gender, age, and smoking behavior in the previous month (how many days and how many cigarettes per day).

► RESULTS

Modality Effects

To answer RQ1, repeated measures analyses¹ were carried out with modality (print vs. video) as a between-subjects factor and time (Time 1, Time 2, Time 3) as a within-subjects factor.² Means and standard deviations for beliefs, attitudes, and intentions by condition are given in Table 1. For beliefs about smoking, the analysis showed that there was no difference between the print and video version in the effects over time, $F(2,212) = 0.34$, $p = .71$. There was a main effect of time on beliefs, $F(2,212) = 10.61$, $p < .001$, $\eta^2 = .091$, but this effect was not different between the modalities. Beliefs at Time 2 ($M = 3.41$, $SD = 0.61$) were more negative toward smoking than beliefs at Time 1 ($M = 3.24$, $SD = 0.68$; $p < .001$), whereas beliefs at Time 3 ($M = 3.28$, $SD = 0.81$) were more positive toward smoking compared to Time 2 ($p < .05$), and did not differ from beliefs at Time 1 ($p = .78$).

For the attitude toward smoking, the analysis showed a significant difference between modalities in the effect over time, $F(2,214) = 4.62$, $p < .05$, $\eta^2 = .041$. Post hoc tests with Bonferroni corrections indicated that, for participants who had read the print version, attitudes did not differ at Time 3 compared to Time 1 ($p = .40$), whereas for participants who had viewed the video,

attitudes were more negative toward smoking at Time 3 compared to Time 1 ($p < .01$). There was no main effect of time on attitudes, $F(2,214) = 0.83$, $p = .44$.

For the intention to smoke, there was neither a difference between the print and video version in the effects over time, $F(2,213) = 1.77$, $p = .17$ nor a main effect of time, $F(2,213) = 0.20$, $p = .82$.

Appreciation

To answer RQ2 on the role of appreciation, we first established whether modality had an effect on appreciation. Univariate analysis revealed a significant effect of condition on appreciation, $F(1,215) = 6.33$, $p < .05$, $\eta^2 = .029$. Unexpectedly, the print version ($M = 2.77$, $SD = .84$) was appreciated more than the audiovisual version ($M = 2.54$, $SD = .79$). This means that increased appreciation cannot be the explanation of the found effect of modality on attitude, because the audiovisual version was the version that showed the effect on attitude. Accordingly, mediation analysis using the bootstrapping method described by Preacher and Hayes (2008) did not find an indirect effect of modality through appreciation on the difference between attitude at Time 1 and Time 3 (effect = 0.022, $SE = 0.18$, 95% confidence interval [-0.0017, 0.0781]).

Distraction

To answer RQ3 on the role of distraction, we first established whether modality had an effect on distraction. Univariate analysis showed that there was no difference between the print version ($M = 1.62$, $SD = .81$) and the audiovisual version ($M = 1.83$, $SD = .93$), $F(1,215) = 2.47$, $p = .12$. Therefore, distraction cannot mediate effects of modality on persuasive outcomes.³

► DISCUSSION

This study provides insight into the effect of printed and audiovisual smoking education materials on the beliefs, attitude, and intention toward smoking of low-educated adolescents. In answer to RQ1, the results show that audiovisual smoking education materials were more effective for this target group at changing the attitude toward smoking than equivalent textual materials. One month after seeing the video, participants had a more negative attitude toward smoking compared to baseline, whereas the text did not influence the attitude. These results suggest that the video version was more persuasive in terms of attitude. However, there were no effects of modality on beliefs and intentions. Beliefs about smoking were more negative immediately after participants had received the education, indicating that the education had

persuasive effects on these beliefs, but it did not matter in which modality the education was presented.

Potential explanations of the found effects that were tested in this study were appreciation and distraction. However, in answer to RQ2 and RQ3, none of these message processing variables played a role in the found effect of video on attitude. For appreciation, it was even found that the text was appreciated more than the video, and this did not mediate the effect on attitude. Thus, differences in these processing variables between text and video do not explain effects of modality on persuasive outcomes. These results suggest that these types of message processing are not responsible for the effect of modality on attitude.

This suggestion is in line with the result that the video version of the smoking education materials had effects on the attitude toward smoking 1 month after participants had seen the video (Time 3). Therefore, an explanation for the effect probably lies in the month in between. Perhaps the participants talked about the message more in this month when they had seen the video. Interpersonal communication has been shown to be an important factor in the effects of communication campaigns (Southwell & Yzer, 2007; Van den Putte, Yzer, Southwell, de Bruijn, & Willemsen, 2011). The more people talk about a health message, the more likely they are to accept the message and change their attitude. Another possibility is that participants remembered the audiovisual message better. Immediately after exposure to the message, the difference may have been too small, but 1 month later it could have made a difference. If the message was more memorable to them at Time 3, it could have had an enhanced influence on their attitude (see Wilson et al., 2010).

The result that the text version was appreciated more than the audiovisual version may be explained by the “talking head” format of the video, which is likely not the format of video the students usually watch. However, to exclude alternative interpretations for effects, it was important to make the content of both versions as comparable as possible. From these results, it is clear that modality alone does not explain why film is often appreciated more. Additional features of film like illustrative moving images, editing, and music and sound effects are likely responsible for such effects. Despite being appreciated less than print, the video still had an effect on the attitude toward smoking. This means that the video worked through a different mechanism, like increased memorability.

Limitations and Future Research

It is important to note that only the attitude toward smoking showed an effect of modality. Beliefs about

smoking as well as intention to smoke were not affected differently by printed and audiovisual materials. It is likely that the effect on attitude was not strong enough to generate a similar effect on intention, which is influenced by several constructs in addition to attitude (Ajzen & Fishbein, 2005). This is also supported by the small effect size of the analysis. Given the small effect on attitude that already occurred after a short exposure, it would be very interesting to see whether more frequent exposure to audiovisual smoking education messages make the effect stronger and also generate effects on intention.

Limitations include the difference in the number of cigarettes smoked in the past month between students who participated in all three time waves of the study and the ones who dropped out. The dropouts smoked more at Time 1. This may be explained by smoking being associated to other behaviors like absenteeism. Another possible limitation is that versions of the materials used in prior years may have been encountered by the students before the study. However, it is unlikely that this happened on a large scale. In addition, the external validity of the video intervention was limited to video interventions with a talking head format. This ensured equivalency of information in both versions, but the video was probably unlike many videos the students are used to. Future research should test the effect of other types of videos.

With regard to future research, studies should include measures of potential explanations of the delayed effect on attitude. This study focused on message processing, like text appreciation and distraction, but these were shown not to mediate the effect. Factors that may have mediated the effect in the month between exposure and measurement, like interpersonal communication and memory, should be included in the next study to be able to test whether these explain the effect.

Conclusion

The present study is the first to test the effectiveness of different modalities of smoking education messages among low-educated adolescents. The results show that audiovisual materials are slightly more effective for this specific target group. This is in contrast to studies with higher educated participants that generally find an advantage of written materials (Byrne & Curtis, 2000; Corston & Colman, 1997). This shows that it is important to adapt smoking education materials to the specific target group of low-educated adolescents, because they are affected differently by messages than other groups who are more often studied. For low-educated adolescents, including audiovisual materials can be beneficial.

► APPENDIX A

Screenshot of Print Material, Two Pages of the Booklet

<p>Opdracht 3</p> <p>Wat kan er gebeuren als je rookt? Zet een cirkel om WAAR of NIET WAAR.</p> <table><tr><td>1. Je krijgt een slechtere conditie.</td><td>WAAR</td><td>NIET WAAR</td></tr><tr><td>2. Je gaat je onrustig voelen.</td><td>WAAR</td><td>NIET WAAR</td></tr><tr><td>3. Je kunt moeilijk stoppen met roken.</td><td>WAAR</td><td>NIET WAAR</td></tr><tr><td>4. Je kunt langer rennen.</td><td>WAAR</td><td>NIET WAAR</td></tr><tr><td>5. Je gaat hoesten.</td><td>WAAR</td><td>NIET WAAR</td></tr></table>  <p>9</p>	1. Je krijgt een slechtere conditie.	WAAR	NIET WAAR	2. Je gaat je onrustig voelen.	WAAR	NIET WAAR	3. Je kunt moeilijk stoppen met roken.	WAAR	NIET WAAR	4. Je kunt langer rennen.	WAAR	NIET WAAR	5. Je gaat hoesten.	WAAR	NIET WAAR	<p>Wat gebeurt er als je rookt?</p> <p>Een gevolg van roken is dat je tanden geel worden. Je kunt bruine vlekken krijgen op je vingers. En je gaat naar sigaretten ruiken. Andere mensen vinden vaak dat rokers stinken.</p>  <p>Is roken gevaarlijk?</p> <p>Als je een tijd rookt, kun je ziek worden. En je kunt last krijgen van je hart. Ook kan roken je longen beschadigen. Een roker kan zelfs zo ziek worden, dat hij eraan doodgaat. Het is daarom beter om niet te roken.</p> <p>10</p>
1. Je krijgt een slechtere conditie.	WAAR	NIET WAAR														
2. Je gaat je onrustig voelen.	WAAR	NIET WAAR														
3. Je kunt moeilijk stoppen met roken.	WAAR	NIET WAAR														
4. Je kunt langer rennen.	WAAR	NIET WAAR														
5. Je gaat hoesten.	WAAR	NIET WAAR														

Translation

Exercise 3

What can happen when you smoke?

Place a circle around TRUE or NOT TRUE

1. You get in worse physical shape.
TRUE NOT TRUE
2. You start feeling tense.
TRUE NOT TRUE
3. It is difficult for you to stop smoking.
TRUE NOT TRUE
4. You can run for longer periods of time.
TRUE NOT TRUE
5. You start coughing.
TRUE NOT TRUE

What happens when you smoke?

A consequence of smoking is that your teeth turn yellow. You can get brown stains on your fingers. And you start smelling like cigarettes. Other people often think smokers smell bad.

Is smoking dangerous?

If you have been smoking for a while, you can get sick. And you can get a heart condition. Smoking can also damage your lungs. A smoker can get so ill, that he dies. That is why it is better not to smoke.

► APPENDIX B

Screenshot of Audiovisual Material, the Actor Speaks the Same Text as in the Print Material (e.g., the right-hand page of Appendix A)



NOTES

1. Considering a multilevel analysis, it proved that there was no significant variance on any of the levels, making it unwarranted to take levels into account.
2. School type (PrO or LWOO) was also added as a between-subjects factor, but neither main effects nor interactions with school type for any of the outcome variables were significant.
3. For the potential mediators, there were main effects of school type. PrO students appreciated the lesson more and were less distracted than LWOO students (all $ps < .05$). However, there were no interactions of school type with modality on these processing variables (all $ps > .20$).

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