

The influence of cigarette warning labels on adolescent's risk perception and the optimistic bias

Bachelorthesis

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Summary

The following study was done for the psychological department conflict, risk and safety at the University of Twente. The overall topic was the influence of cigarette warning labels on adolescent's risk perception and the optimistic bias. For years warning labels and their effects make up a major part of psychological and health studies. As a matter of priority they try to find out which type of warning label have the greatest emotional impact on people's decision to stop or avoid smoking. The present study joined this group of research by testing the impact of two different sorts of warning labels. The method of measurement took place in a pre and posttest of a questionnaire which measured risk perception and the optimistic bias. Between the pre and posttest people were randomly assigned to one of two conditions which differed in the severity of warning label. The first condition contained warning labels which indicated consequences of smoking in a more harmless way. However the second condition contained warning labels which showed the consequences of smoking in a more harmful way. One of the most interesting finding was that non-smoker's risk perception was more influenced through the more severe warning labels than smoker's risk perception. Another interesting and hypothesized finding was that the more harmful warning labels tend to have a greater impact on adolescent's optimistic bias than the more harmless warning labels. Based on the experiences and findings of the present study there were some recommendations for future studies and policy. The impact of habituation is one great issue which has to be recognized, therefore it would be interesting to set up the study with repeated exposures to warning labels. Furthermore health institutions and policy have to recognize two important facts. First fact is that different smoking status are related to different perceptions of risks and and the second fact is that adolescents tend to have an unrealistic perception of smoking related risks.

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Introduction

Every day people are confronted with risks. Most known risks are for instance getting involved in a car accident, being a victim of violence or taking diverse health risks like taking drugs, drinking alcohol or smoking. According to the literature is there a difference between those risks which are under personal control and those which are hard or impossible to control personally (Slovic, Peters, Finucane & Mac Gregor, 2005). Those risks which are under personal control are a scientifically interesting topic which is part of many studies. To measure the extent of people's perceived personal risk, studies measure a construct named risk perception (Schwarzer, 2014; Renner & Schupp, 2011).

According to the literature, risk perception is the subjective appraisal of the likelihood of a specified type of accident happening and furthermore a construct which shows how concerned people are with the possible consequences (Sjöberg, Moen & Rundmo, 2004). Klein and Stefanek (2007) indicate that risk perception is related to a number of behaviors including health behavior, medical decision taking and processing health information. Furthermore the literature shows that health behavior is often related to the phenomenon "illusion of control" which means that people think that their health risks are controllable so that they have no risks to get a serious disease (Sjöberg, Moen & Rundmo, 2004). Smoking is a good example for that phenomenon.

The research findings of Jemal, Bray, Center, Ferlay, Ward and Forman (2011) are showing that smoking is responsible for more than 80 percent of all lung cancer incidents in men and 50 percent in women worldwide. In addition, smoking influences other diseases for example cardiovascular diseases, bronchitis, stroke and more (Kwon, Lopez, Agarwal, Soliman, Lip, Alonso & Chen, 2014). The literature is in agreement on the fact that smoking is the most avoidable cause of death worldwide (Pirie, Peto, Reeves, Green & Beral, 2013). Because of those facts it is not surprising that many countries and governments are interested in prevention and intervention, but the literature refers to the fact that many people, especially adolescents, still do not have any awareness for the risks of smoking (Slovic, Finucane, Peters & MacGregor, 2004).

The illusion of control is further provided by Song, Morrell, Cornell, Ramos, Biehl, Kropp and Halpern Fehlscher (2009). They show that many adolescents are missing good decision making and risk-judging skills, so that they are often not capable to consider their own risk, leaving them in a sense of being inviolable to diseases. Slovic et al. (2004) add that

adolescents are often driven by affective impulses and pleasure and therefore suppress the thoughts about negative consequences of their behaviors. Smokers and ex-smokers tend to agree with several myths, which are clearly disproved through research findings and medicine (Weinstein, Marcus & Moser, 2005). One example emerged from the study of Weinstein et al. (2005) which shows that more than the half of all respondents in their study believed that sport undoes most smoking effects. Another false but widely-used assumption is that occasional smoking is less harmful than daily smoking (Amrock & Weitzman, 2014). Occasional smoking is characterized by irregular smoking habits. Research indicates that occasional smokers often smoke because of social or stress-related factors. Furthermore occasional smokers often do not characterize themselves as smokers which led them minimize their personal risks (Brown, Carpenter & Sutfin, 2011). Especially men, adolescents and occasional smokers tend to believe that occasional smoking has nearly no negative health consequences (Amrock & Weitzman, 2014).

Scientific research has shown that these assumptions are partly based on ignorance but mainly exist because of the risk denial which is closely linked to the optimistic bias and the illusion of control (Sjöberg, 2000). According to a number of studies, especially adolescents are prone to the optimistic bias which is reflected in the phenomenon that they believe to have less risk of a disease due to smoking than their peers (Borrelli, Hayes, Dunsiger & Fava, 2010). Arnett (2000) showed that especially adolescents are well known with the long-term consequences of smoking but they often downplay the short-term consequences. The explanation for this is grounded on the false belief that young people think that they stop smoking before any damage can occur.

For years, warning labels on cigarette packs are at a great interest when it comes to preventive and interventionist methods. Their primary aims are to inform people about the possible consequences of smoking and to prevent them from starting smoking (Hammond, 2011). According to Lench and Levine (2005) warning labels have to include three characteristics to alter behavior successfully. First of all the target group have to view themselves as at risk, then they have to believe that they are able to control their smoking behavior and in the end they have to remember the given information. The first step, namely achieving that a smoker perceives the risks of his behavior, is one of the most difficult steps in health promotion because of the optimistic bias, as mentioned earlier.

In the 1960's warning labels differed much from those warning labels that we know today (Beltramini, 1988). At that time warning labels were first printed on cigarette packages and advertisements in the US. They were much more mild and often formulated as "it might be possible that smoking is hazardous to your health". Clearly later, namely since 2002 every European country is obliged to print warning labels on cigarette packages (Willemsen, 2005). Since these days much research was done to find out the most influential and successful characteristics of warning labels (Beltramini, 1988; Lench & Levine, 2005; O'Hegarty, Pederson, Nelson, Mowry, Gable & Wortley, 2006). Lench and Levine (2005) found out that frightening warning labels decrease the optimistic bias concerning smoking. For this reason scientific research has focused on the impact of emotionally provocative warning labels to increase people's sensitivity and decrease people's optimistic bias (Lench & Levine, 2005). Research shows that especially anxiety provoking and emotionally harmful pictures are effective (Glock, Müller & Ritter, 2012; Hammond, 2011). In contrast, text-based warning labels seem to have less impact on the smoking behavior of people than pictures (Hammond, 2011). According to Hammond, Fong, Cummings, Driezen, McNeill and Borland (2007) the most effective warning labels are a combination of pictorial and textual information. Research shows that effects of warning labels are also due to individual characteristics. According to White, Bariola, Faulkner, Coomber and Wakefield (2014) there are especially women and occasional smokers who conceive warning labels as fearful.

In sum, numerous studies have proven the effects of warning labels and the relationship between adolescent smokers, risk perception and the optimistic bias. However, there is no study which shows the direct effect of warning labels on the optimistic bias of adolescents. The goal of the present study is to find out in which way the risk perception of adolescents is influenced by an optimistic bias and in which way this perception is changed through present warning labels. Furthermore this study compares the impact of warning labels, differing in cruelty, on risk perception and the optimistic bias.

Based on the literature it is hypothesized that participants who have seen the more harmless pictures of indicating an illness are going to be less influenced by those pictures than people who have seen the real more harmful warning labels. Furthermore it is hypothesized that the harmful warning labels have a greater impact on people's risk perception and optimistic bias than the more harmless warning labels. Furthermore it's hypothesized that non smokers are better able to estimate their risks than smokers, occasional smokers and ex-smokers and therefore show less optimistic bias than those participants.

Methods

Design and procedure

The data was collected with a cross-sectional English-language online questionnaire which measured risk perception and the optimistic bias. The online questionnaire offered the advantage of guaranteeing anonymity. The questionnaire was therefore spread via the internet, especially via social networks like Facebook and Twitter. It was expected to reach many different people with different backgrounds. The questionnaire itself consisted of two conditions and three parts. First there was a pretest with the questionnaire which should identify people's risk perception and optimistic bias. Then the participants were shown some pictures, which differ in severity. The Qualtrics program assigned each participant randomly to one of the two conditions. In the first condition people were confronted with pictures which implicated some consequences of smoking. One picture for example showed the radiograph of lungs in combination with the text "Smoking causes fatal lung cancer". In the second condition people were confronted with some graphic warning labels from Canada and Brazil. They showed the consequences of smoking in a more harmful way than the pictures in the first condition. One picture for example showed two lungs. On the left side there were the healthy lungs and on the right side there were the black and obviously damaged lungs in combination with the same text as in the first condition namely "Smoking causes fatal lung cancer". In the posttest the participants were asked to fill in the questionnaire again. In sum the two conditions included the same questionnaire but different pictures. The purpose of the two conditions was to look to what extent the constructs risk perception and optimistic bias were influenced through the pictures. The data from the pre- and posttest was collected to look how much risk perception was influenced by the warning labels and how much this is influenced by either harmless or harmful warning labels. Furthermore it was tested whether participants showed an Optimistic Bias and in which way this was changed through the warning labels.

Measurement

Before taking part in the questionnaire the participants were informed about the study, its overall topic and the process of questionnaire through an informed consent. The real purpose and fields of interest were not told at the beginning because there might have been some influences on answering the questions.

The first part of the questionnaire asked for demographic variables like sex, age, educational level and nationality. In addition the questionnaire asked for the current smoking status. There were four options to answer this question namely: daily smoker, occasional smoker, ex-smoker, non smoker. After that the participants were asked to give their opinion on eight statements concerning smoking related risks to assess their knowledge. The statements were based on the “short form of smoking consequences questionnaire” measuring parts of people’s risk perception (Myers, Mc Carthy, Mc Pherson & Brown, 2003). They include the following eight statements: smoking will make a person cough/ smoking causes bad teeth/ smoking can cause infertility/ smoking increases the risk of getting a stroke/ smoking increases the risk of getting oral and throat cancer/ smoking is hazardous to somebody’s health/ the more somebody smokes the more he-she risks his-her health/ by smoking somebody risks heart disease and lung cancer. The response options were a typical 5 point Likert scale including the options: extremely unlikely, unlikely, not unlikely not likely, likely and extremely likely. The results of the reliability analysis reveal that the risk perception construct is quite reliable. The pretest-value of the Cronbach’s alpha is 0.91. The posttest-value of the Cronbach’s alpha is 0.95.

After that the participants were asked to give their opinion on nine statements concerning the optimistic view of smoking. Those statements were based on two existing questionnaires. The first four statements were taken from the questionnaire from Arnett (2000). The statements were: Most people who smoke all their lives eventually die from an illness caused by smoking / I doubt that I would ever die from smoking even if I smoked for 30 or 40 years/ I could smoke for a few years and then quit if I wanted to/ I think the risk of getting a serious smoking related disease is higher for others than for myself. The other five statements were taken from Slovic (1998). Those statements were: I think there is really no risk at all for the first few years/ Every single cigarette smoked causes a little bit of harm/ Although smoking may eventually harm a person’s health the very next single cigarette the person smoke will probably not cause any harm/ Harmful effects of smoking rarely occur until a person has smoked steadily for many years/ Smoking at the daily rate of one package of cigarettes each day will eventually harm a person’s health. The options for the responses were a typical 5-point Likert scale including the options: strongly disagree, disagree, neither disagree nor agree, agree and strongly agree. After recoding the statements 1, 6 and 9, a reliability analysis is carried out. The results of the reliability analysis reveal that the optimistic bias construct is

quite reliable. The pretest-value of the Cronbach's alpha is 0.66. The posttest-value of the Cronbach's alpha is 0.78.

After filling in the first part of the questionnaire the participants were randomly assigned to one of the two conditions. In the first condition the participants were shown pictures which indicated consequences of smoking. These pictures were assumed to be less effective than the pictures in the second condition because they were much more harmless. To avoid any misunderstandings, this condition is going to be called "First Condition" throughout the entire Bachelor thesis. In the second condition the participants were shown pictures which demonstrated the consequences of smoking in a more harmful and therefore more effective way. In total there were six pictures per condition which differed in the graphic information but not in the textual information or size.

After looking at the pictures the participants were asked to fill in the questionnaire again except the part of the demographic variables.

After filling in the pre- and posttest the participants were debriefed and informed about the real purpose of the study and its goals.

Participants

The age groups of interest were adolescents and young people aged 14-30. The data was collected in the Netherlands and Germany via social media. It contained students, trainees and pupils. The demographic variables age, sex, educational level, nationality and smoking status were taken to categorize the participants.

The average age of the participants was $M=23.9$. The youngest participant was 17 years old and the oldest participant was 30 years old. All in all there were 147 participants who filled in the questionnaire. 25 of them were removed from the data because they have quit the questionnaire too early. After removing there were 122 participants left, whose data was further analyzed. The random assignment resulted in 64 participants who were assigned to the first condition and 58 participants who were assigned to the second condition. The average age and the distribution of the sexes were almost the same in both conditions. In the first condition the average age was $M=23.89$. In the second condition the average age was $M=23.79$.

Out of the 122 participants there were 82 women and 40 men. The amount of Germans was high in this study. There were namely 104 Germans, 11 Dutch people and 7 people who came from Austria, Switzerland, Norway, Russia and Turkey. The diversity of nationalities is attributed to the method of distribution, namely social media like Facebook and Twitter.

Most of the participants claimed that their educational level was a Bachelor degree or the German Abitur, followed by some participants who achieved a Master degree, the German mittlere Reife or the German Fachhochschulreife. All in all it has to be recorded that the overall educational level was high. In addition, participants were asked to claim their current smoking status. The results showed that there were 38 smokers who filled in the questionnaire. Furthermore there were 44 non-smokers, 21 occasional smokers and 19 ex-smokers.

Analysis

The questionnaire was constructed through the program Qualtrics. The results were analyzed with SPSS. First there was checked whether the data was complete. Incomplete data were removed and not further analyzed. The demographic variables were analyzed with regard to distribution and frequency. Furthermore the results from the pre- and posttest were analyzed and compared through statistical tests and methods.

First of all it was checked whether the sample was distributed normally and to what extent the randomization has worked. A Chi square test was carried out to guarantee a normal distribution concerning the demographic variable sex. An independent samples t-test was carried out with regard to the variable age to guarantee a normal distribution.

In order to test the hypothesis, which assumed that there were differences between the conditions with regard to the variables risk perception and optimistic bias, an analysis of covariance was carried out. The pretest was the covariate, the factor was the current condition and the dependent variable was the posttest. The analysis of covariance enabled testing with regard to interaction and main effects. If testing reveals interaction effects, those effects will be further analyzed with regard to its direction and power, through parameter estimates and illustrated through a scatter plot.

In order to test whether there were differences between the smoking status in both conditions between the pretest and posttest, another analysis of covariance was carried out. Therefore the

pretest was the covariate, the conditions and the smoking status were the independent variables and the posttest was the dependent variable. The same procedure concerning interaction and main effects was carried out.

Results

Table 1. *Distribution of Demographic Variables*

Demographic Variables	Condition 1 “harmless”	Condition 2 “harmful”	N
Participants	64	58	122
Age (M)	23.89	23.79	23.84
Sex			
Male	20	20	40
Female	44	38	82
Smoking Status			
Smoker	21	17	38
Occasional Smoker	8	13	21
Ex-Smoker	12	7	19
Non-Smoker	23	21	44
German Educational level			
Abitur	19	17	36
Mittlere Reife	4	7	11
Hauptschulabschluss	4	5	9
Fachhochschule	8	2	10
Bachelor	19	15	34
Master	9	10	19

The distribution of participants and the important demographic variables age, sex and smoking status seemed to be quite normal distributed. A Chi square test was carried out to prove the normal distribution of the variables sex and smoking status. The results were not significant, therefore it is assumed that both variables are normal distributed. To prove the normal distribution of the variable age, an independent samples t-test was carried out. The result confirmed the assumption of a normal distribution. The demographic variable nationality was not further analyzed.

After looking for normal distribution, the correlations between the constructs risk perception and optimistic bias in pre- and posttest were given (Table 2).

Table 2. *Correlations between pretest and posttest*

					Risk perception		Optimistic Bias	
					pre	post	pre	post
	Age	Mean(SD)	Age	Educational level				
	Educational level							
Risk perception	pre	31.61(6.81)	.28**	.12	1.00			
	post	33.12(7.01)	.25**	.09	.82**	1.00		
Optimistic Bias	pre	22.60(4.89)	-.06	.00	-.22	-.12	1.00	
	post	20.77(5.76)	-.07	-.11	-.17	-.27	.54**	1.00

Correlation is significant at the 0.05 level (2-tailed).*

Correlation is significant at the 0.01 level (2-tailed).**

Risk perception

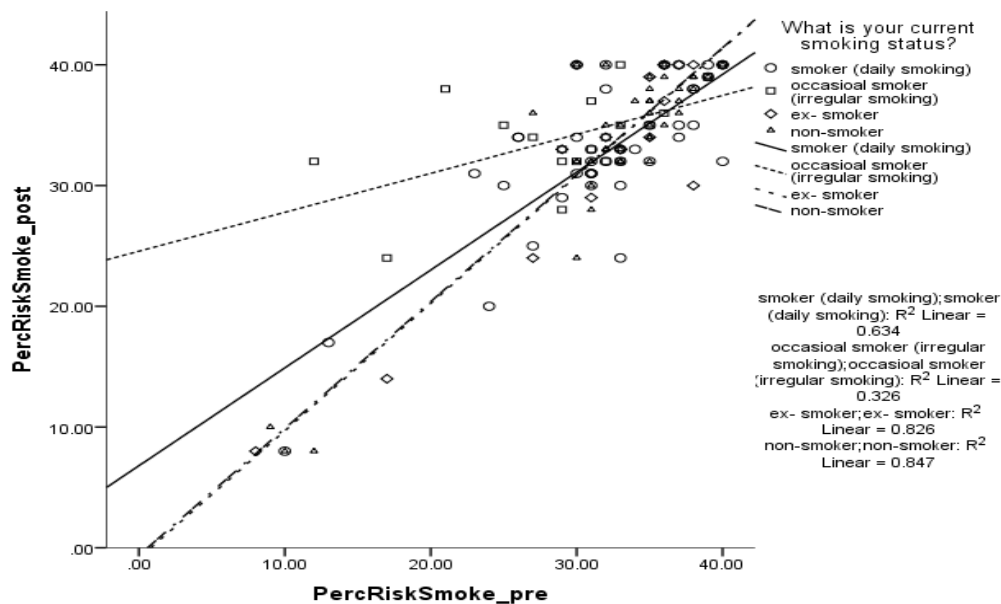
After identifying normal distribution and correlations, the construct risk perception was further analyzed. An analysis of covariance was carried out to test whether there were effects of severity of warning label with regard to risk perception. The dependent variable was the posttest, the independent variable were the conditions, named severity of warning label and the covariate was the pretest. The analysis of covariance showed no significance of severity of warning label ($F(1; 119) = 0.16, p = .69$), only a main effect of the covariate pretest of risk perception ($F(1; 119) = 235.32; p < .05$). Further analyses are omitted due to the non-significance of severity of warning label.

Another ANCOVA was carried out to test whether there were effects of the severity of warning label and the smoking status with regard to risk perception. Dependent variable was posttest of risk perception, the independent variables were the severity of warning label and the smoking status, the covariate was the pretest of risk perception. There was no main effect of severity of warning label ($F(1; 109) = 0.01, p = .94$) which indicated that there were no differences between the posttests of the two severity of warning label conditions with regard to risk perception. A main effect of smoking status was found, which indicated a difference between the posttests with regard to smoking status ($F(3; 109) = 12.28, p < .05$). To get more detailed information about the main effect, the smoking status was further analyzed with Bonferroni confidence intervals. The analysis carried out showed that there was no difference

between the non-smokers and ex-smokers with regard to risk perception (95% CI= [-9.78; 9.51]). It was further identified that there was a difference between the smokers and the non-smokers (95% CI= [0.22; 16.05]) and between the occasional smokers and the non smokers (95% CI= [16.83, 34.56]).

Furthermore the analysis of covariance identified a two-way interaction effect between smoking status and pretest risk perception (Graphic 1; $F(3; 109) = 10.43, p < .05$). The beta decreases from non-smokers to smokers (95% CI= [-0.54; -0.02]) and occasional smokers (95% CI= [-0.99; -0.43]). There was no difference in beta between non-smokers and ex-smokers (95% CI= [-0.25; 0.34]).

Graphic 1. *Interaction effect between smoking status and tests*

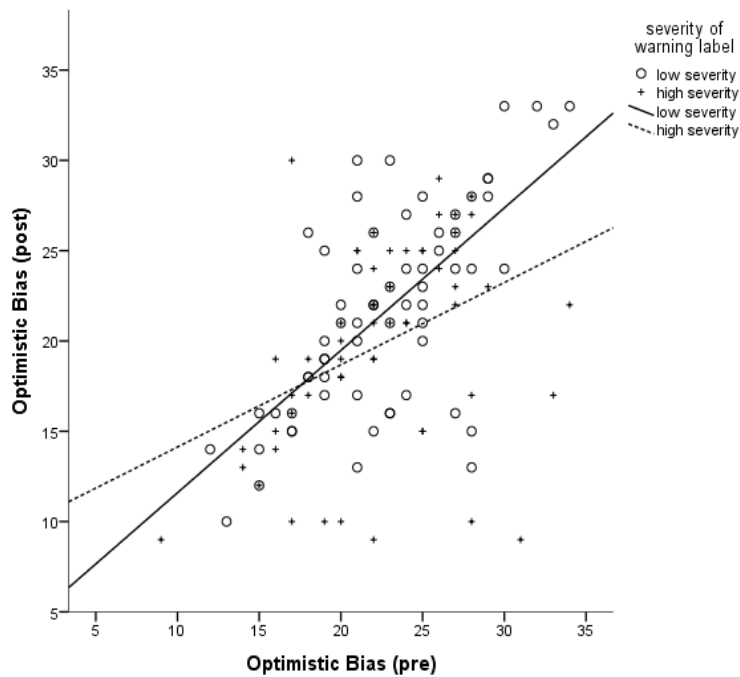


Optimistic bias

After identifying normal distribution and correlations, the construct optimistic bias was analyzed. An analysis of covariance was carried out to test whether there were effects of the severity of warning label conditions with regard to optimistic bias. The dependent variable was the posttest, the independent variable was severity of warning label condition and the covariate was the pretest. The analysis of covariance showed no significance of severity of warning label ($F(1; 118) = 2.05, p = .16$), a statistically significant main effect of the covariate pretest of optimistic bias ($F(1; 118) = 49.08.28; p < .05$) and a not statistically significant, but marginally trend, interaction effect between severity of warning label and

pretest optimistic bias ($F(1; 118) = 3.52; p = .06, p < .10$). The interaction effect was analyzed with the help of parameter estimates. Those estimates showed that the association between pre and post test were different between high and low severity of warning label (Graphic 2; $B=0.33; SE^b=0.18; t=1.88; p=.06$). This indicates that the severity of warning label reduces optimistic bias.

Graphic 2. *Trend of interaction effect between optimistic bias and conditions*



Discussion

With regard to the effect of the two different conditions it was hypothesized that participants who have seen the more harmless pictures of indicating an illness are going to be less influenced by those pictures than people who have seen the more harmful warning labels. Furthermore it was hypothesized that the harmful warning labels have a greater impact on people's risk perception and optimistic bias than the more harmless warning labels. The results showed a trend which confirms these hypotheses. The steeper regression line for the first condition showed a stronger connection between the pre and posttest than the results for the second condition. Therefore it can be assumed that the construct of the optimistic bias changed from pre to posttest in the second condition. Thus the harmful warning labels tend to have a greater impact on people's optimistic bias than the more harmless ones. Based on the results of this study, both groups of warning labels tend to have no significant impact on people's risk perception. Furthermore the results of the present study show that the smoking status tend to be important when it comes to risk perception. At the beginning it was hypothesized that non smokers are better able to estimate their risks than smokers, occasional smokers and ex-smokers and therefore show less optimistic bias and a greater risk perception than the others. The results showed that the risk perception of ex-smokers and non smokers tend to be more influenced by the warning labels than the risk perception of regular smokers and occasional smokers. Furthermore there was a clear difference between the non-smoker's risk perception and the risk perception of occasional and regular smokers in the posttest. Therefore the hypothesis is partly confirmed. It is surprising that the risk perception of non smokers is more influenced than the risk perception of regular smokers because somebody might think that smokers have to be more influenced through smoking warning labels than non- smokers. In contrast, Glock and Kneer (2009) hypothesized that warning labels have no effect on non-smokers because the given information through warning labels are not important for them. According to the literature, habituation is the important factor when explaining those findings (Wogaltar, Conzola & Smith-Jackson, 2002). The more a smoker is confronted with warning labels, the less likely he will notice it. Therefore it is not surprising anymore that non-smoker's risk perception can be more influenced through warning labels than smoker's risk perception.

The findings concerning warning labels are in line with results of other studies. Hammond's review (2011) of health warning messages for example supports the fact that pictorial warning

labels are significantly more effective if they trigger strong emotional reactions. Furthermore his findings supports that warning labels can increase people's risk perception.

Findings from Glock and Kneer (2009) imply that smokers seem to be realistic about their increased chance of getting a smoking-related disease. In contrast to those findings are the results of the present study. The findings imply that people showed an optimistic bias and tend to be more realistic after looking at harmful warning labels. Thus people in general are not as realistic as Glock and Kneer (2009) stated. However the present study misses the connection between the optimistic bias and the smoking status of a person. While the literature is in agreement on the fact that smokers are more prone to an optimistic bias than non-smokers, the results of the present study are not able to prove that (Waltenbaugh & Zagumny, 2004; Arnett, 2000). The amount of non- smokers might be a possible explanation for that.

The smoking status "occasional smoker" and its risk perception are still hardly investigated. The study of Amrock and Weitzman (2014) about occasional smoking is one of the few studies which tried to find out more about occasional smoker's habits and thoughts. So it might be not surprising that findings are contradictory. The results of the study showed that occasional smokers tend to underestimate their risks and therefore perceive lesser risks than regular smokers. The findings of the present study contradict and show that occasional smokers and regular smokers tend to perceive risks. However it is one limitation of the present study that it did not find out whether the smoking status and the optimistic bias are connected, so therefore nothing can be said about the underestimation of risks in relation to the smoking status. Another limitation of the present study is related to the already mentioned process of habituation. The participants were only once exposed to the warning labels. As reported by the literature, habituation is a prominent factor for risk denial in smokers (Johnson, Wu, Coleman & Choiniere, 2014). Therefore it would be interesting to set up the study with repeated exposures to different warning labels to look for habituation effects on risk perception and the optimistic bias. In addition to the habituation factor the literature still knows another reason for contradictory results. According to Arnett (2000) many studies has failed because adolescents simply do not feel involved by diseases like stroke or heart attacks. They do not apply those diseases to their age and therefore underestimate risks. Another interesting set up would integrate adolescents and adults in different groups of ages to look for differences and agreements. As mentioned earlier in the introduction, risk perception and the optimistic bias differed much in relation to the age of participants (Borrelli et al., 2010;

Amrock & Weitzman, 2014). Thus future research and policy have to recognize adolescent's unrealistic perception of smoking related risks because a "greater optimistic bias predicted a lower likelihood of cessation" (Borrelli et al., 2010, p. 1105). Furthermore it has to be recognized that different smoking status are related to different perceptions of risks.

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Appendix

Questionnaire

Dear participant, Welcome to this study!

You are going to be part of a scientific study which is done in the context of the psychological department of the University of Twente. I developed this online survey as part of my bachelor thesis.

After dealing with some general questions about yourself, you are going to fill in a questionnaire concerning smoking. After that you are going to see some pictures and texts. After seeing those pictures you are going to answer some more questions. The whole process will take about 10 - 15 minutes of your time. Your data will be processed anonymously.

Katharina Hohl

Pretest:

Demographic variables:

- How old are you?
- What is your Nationality: German/ Dutch/ other
- What is your gender? Female/ male
- Educational level (in case you are still on school please give your expected qualification)
 - o Abitur, mittlere Reife, Hauptschulabschluss, Fachhochschulreife, VWO, HAVO, MBO, bachelor, master
- What is your current smoking status: smoker (daily smoking), ex-smoker, occasional smoker (irregular smoking), non-smoker

Each of the following statements contains a possible consequence of smoking.

For each of the statements below, please rate how likely or unlikely you believe each consequence is for you when you smoke. If you have never smoked, you are to answer according to your personal beliefs about the consequences when smoking, regardless of what other people might think. (very unlikely, unlikely, not unlikely not likely, likely, very likely)

Smoking will make a person cough

Smoking causes bad teeth

Smoking can cause infertility

Smoking increases the risk of getting a stroke

Smoking increases the risk of getting oral and throat cancer

Smoking is hazardous to somebody's health

The more somebody smokes the more he/she risks his/ her health

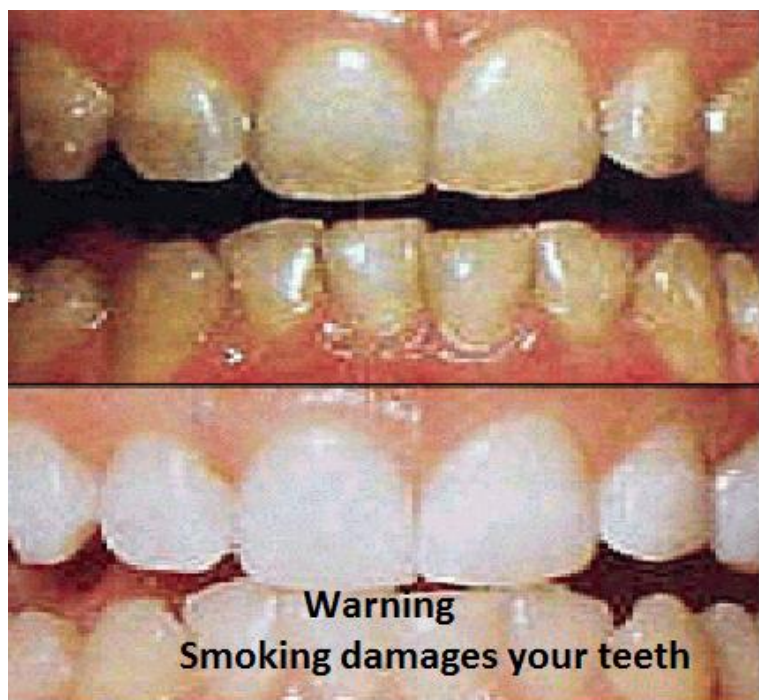
By smoking somebody risks heart disease and lung cancer

The following statements ask for your opinion. Please rate how agree or disagree you are.
(strongly disagree, disagree, neither agree nor disagree, agree, strongly agree)

- Most people who smoke all their lives eventually die from an illness caused by smoking
- I doubt that I would ever die from smoking even if I smoked for 30 or 40 years
- I could smoke for a few years and then quit if I wanted to
- I think the risk of getting a serious smoking related disease is higher for others than for myself
- I think there is really no risk at all for the first few years
- Every single cigarette smoked causes a little bit of harm
- Although smoking may eventually harm a person's health the very next single cigarette the person smoke will probably not cause any harm
- Harmful effects of smoking rarely occur until a person has smoked steadily for many years
- Smoking at the daily rate of one package of cigarettes each day will eventually harm a person's health

Warning labels

Condition 1:



WARNING
CIGARETTES
CAUSE
STROKES
AND HEART
DISEASE.



Smoking can cause a slow and painful death



WARNING:
Smoking can kill you.

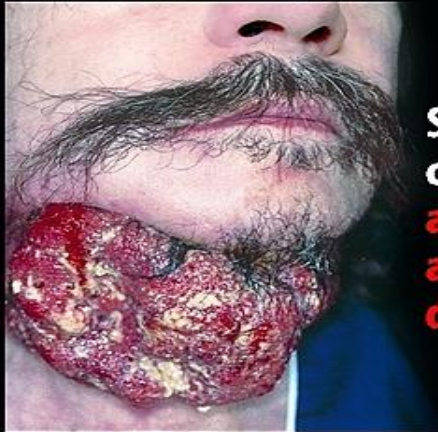


Condition 2:



WARNING:
Cigarettes
cause strokes
and heart
disease.





**Smoking
can cause
a slow
and painful
death**



WARNING
SMOKING DAMAGES
YOUR TEETH



WARNING:
Smoking can kill you.



Posttest:

Each of the following statements contains a possible consequence of smoking. For each of the statements below, please rate how likely or unlikely you believe each consequence is for you when you smoke. If you have never smoked, you are to answer according to your personal beliefs about the consequences when smoking, regardless of what other people might think. (very unlikely, unlikely, not unlikely not likely, likely, very likely)

Smoking will make a person cough

Smoking causes bad teeth

Smoking can cause infertility

Smoking increases the risk of getting a stroke

Smoking increases the risk of getting oral and throat cancer

Smoking is hazardous to somebody's health

The more somebody smokes the more he/she risks his/ her health

By smoking somebody risks heart disease and lung cancer

The following statements ask for your opinion. Please rate how agree or disagree you are. (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree)

- Most people who smoke all their lives eventually die from an illness caused by smoking
- I doubt that I would ever die from smoking even if I smoked for 30 or 40 years
- I could smoke for a few years and then quit if I wanted to
- I think the risk of getting a serious smoking related disease is higher for others than for myself
- I think there is really no risk at all for the first few years
- Every single cigarette smoked causes a little bit of harm
- Although smoking may eventually harm a person's health the very next single cigarette the person smoke will probably not cause any harm
- Harmful effects of smoking rarely occur until a person has smoked steadily for many years
- Smoking at the daily rate of one package of cigarettes each day will eventually harm a person's health

End of questionnaire

First of all, thanks for participating!

At the end of this study I have to tell you about the purpose of this questionnaire. As you may have recognized I'm interested in your smoking habits and risk perception. Furthermore I'm interested in a phenomenon called "optimistic bias".

The optimistic bias theory suggests that people, especially young people tend to underestimate their own risks in comparison to others. According to other studies, young people often think that they are inviolable to smoking related health consequences.

The questionnaire that you have filled in has two conditions which differ in the cruelty of the pictures. Every participant was randomly assigned to one of the conditions.

One condition contains pictures that indicate smoking related health consequences in a more harmless way than the other one showing pictures of illnesses which can be found on cigarette packages all over the world. These are so called "warning labels" and I'm interested in how much your risk perception is influenced by such warning labels. It is hypothesized that people who have seen the more harmless pictures of indicating an illness are going to be less influenced by those pictures than people who have seen the real warning labels. Furthermore I expect that people's risk perception is often biased through optimistic thinking. It is therefore hypothesized that people who have seen the real warning labels are going show less optimistic bias than those who have seen the more harmless pictures.

If you are interested in the results of this study you can contact me via e-mail:
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