

How Dangerous is it to Smoke?:

Smoking Risk Perceptions and Moralization in the United States and Denmark

Marie Helweg-Larsen

Dickinson College

Biography: Prof. Helweg-Larsen's research is in the areas of cross-cultural psychology, health psychology, and social psychology. Her research investigates the causes, consequences, and correlates of the optimistic bias (people thinking they are less at risk than their peers) - that is, why do people do risky things that they know they should not. She also studies health communication, gender, and public health. Prof. Helweg-Larsen received her Ph.D. from the University of California, Los Angeles. She has served as an associate professor of psychology at Dickinson College since 2002.

Note: These results are presented in full in this manuscript under review: Helweg-Larsen, M., & Nielsen, G. A. *Smoking cross-culturally: Risk perceptions among young adults in Denmark and the United States.*

Abstract

Research examining smokers' understanding of their smoking risk reveals that smokers acknowledge some risk but often deny or minimize personal risk. We examined risk perceptions of lung cancer among smokers and non-smokers in a smoking-lenient (Denmark) and a smoking-prohibitive (the United States) culture. Participants were 275 Danish students attending trade schools (mean age 22.6) and 297 U.S. students attending community colleges in Florida (mean age 23.6). Results revealed cross-cultural differences suggesting that Danish smokers showed greater risk minimization than U.S. smokers. In addition, in both countries the risk of a typical smoker was rated as lower by smokers than non-smokers and smokers rated their personal risk as lower than they rated the risk of the typical smoker. Cross-cultural differences in moralization of smoking might be one explanation for these findings.

Key words: risk perception, smoking, cross-cultural, Denmark, United States

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Do smokers truly appreciate the health risks they undertake by smoking? The answer to this question has profound implications for health educational programs, smoking cessation programs, public health policy as well as law suits against tobacco companies (e.g., Slovic, 2001). In a review of the literature Weinstein (1998) concluded that smokers generally acknowledge that they take risks by smoking but underestimate the risks they take both relative to smokers and non-smokers. Smokers also think that their brand of tobacco is less dangerous and has less tar than the brands of other smokers (Segerstrom, McCarthy, Caskey, Gross, & Jarvik, 1993) and smokers hold a variety of incorrect beliefs about smoking. For example, 52% of smokers in a nationally representative sample of U.S. adults agreed that exercise can undo most of the negative effects of smoking (Weinstein, Marcus, & Moser, 2005). In addition, smokers tend to acknowledge that it is hard to quit although younger smokers also believe that they would have an easier time quitting than other smokers and that they are less addicted (Weinstein, Slovic, & Gibson, 2004). Youth smokers in particular feel that they are not personally at risk because they expect to stop smoking soon (Slovic, 2000).

Most of the research on smoking risk perceptions has been conducted in the U.S. and to a lesser extent in Australia, Britain, and other Western European countries. Researchers often acknowledge the need for cross-cultural research but rarely actually examine the cultural basis of the conclusions they draw. Conducting cross-cultural research on smoking risk perceptions is important for theoretical reasons (culture is one important source of risk perception information) and for applied reasons (culturally-relevant research is needed to make health education programs and interventions culturally sensitive and effective).

How do people come to believe that a given behavior (such as smoking) is dangerous? People learn about smoking and its health consequences from numerous culturally-based sources, although there is virtually no research examining the sources of *risk information* specifically. In a study using 178 focus groups of 1,175 U.S. teenagers, the primary sources for both pro-smoking and anti-smoking messages were family and peers, school, television, and movies, with family and peers providing the

strongest messages (Crawford, 2001). Risk information is often embedded in both pro-smoking messages (e.g., “short-term smoking is not that dangerous and it is not that hard to quit”) and anti-smoking messages (e.g., “smoking causes wrinkles, bad breath, and emphysema”). Naturally, the *content* of communication from all these sources is culture-bound, including risk information from interpersonal (family and peers), institutional (school, church, and medical establishments) and media (especially TV, movies, advertising, and merchandising) sources. Furthermore, how the messages from these sources are *understood* and *internalized* varies by culture.

People can also learn about the dangers of smoking via other routes, such as from direct or indirect personal experiences with the negative health consequences of smoking. Affective states such as depression or anxiety can also alter risk perceptions (for a review see Helweg-Larsen & Shepperd, 2001). Again, culture might itself influence interpretations of personal experiences and negative affective states. In sum, how do we know that smoking is dangerous? We know because we have been told by our culture. Thus, risk perceptions are important to study in their cultural context.

Although there is a paucity of research on culture’s effect on smoking risk information one study suggests that culture is related to risk perceptions of smoking. In a study of Bosnian refugees living in the U.S. smokers estimated their risk (for lung cancer and heart attack) to be lower than the risk of other smokers and thought their personal risk was about the same as the risk of non-smokers (Helweg-Larsen & Stancioff, 2006). That is, the Bosnian smokers generally did not think that their smoking put them at increased risk for lung cancer. Furthermore, the more acculturated the participants were to U.S. culture, the more dangerous they thought it was to smoke although acculturation was not associated with personal susceptibility of smoking (Helweg-Larsen & Stancioff, 2006). This finding suggests that culture matters in risk perceptions of smoking; adjustment to U.S. culture involved accepting the U.S. cultural message that smoking is dangerous.

Research in Denmark and the U.S. provides a good test of the effect of cultural differences in smoking risk perception because the countries are similar in many ways but differ in smoking prevalence, restrictions on public smoking, and discourse on the dangers of smoking. The U.S. and Denmark are similar in having a parliamentary democracy, a highly advanced economy, a consumer orientation, and are both members of NATO. Both countries can be characterized as individualistic; in Hofstede’s (2001)

individualism ranking of 53 countries the U.S. was ranked first and Denmark ninth. The two countries, however, also differ. With only 5.2 million people, Denmark's population is much smaller and also more homogeneous than the U.S. population. Denmark's social and welfare benefits are more extensive than in the U.S. and personal income tax is correspondingly much greater in Denmark. Smoking prevalence is somewhat greater in Denmark than in the U.S.; in 2000 30% of Danes and 23% of Americans smoked (Shafey, Dolwick, & Guindon, 2003). Thus, the U.S. and Denmark are similar in many ways but differ in smoking prevalence as well as restrictions on public smoking and discourse on the dangers of smoking, as discussed below.

Historically, U.S. cultural values have emphasized independence, autonomy, and the right to take risks if one so pleases. Thus, prior to the 1970s, cigarette smoking was considered an acceptable voluntary health risk (Brandt, 1998). This perspective changed fundamentally when the health risks of passive smoking were laid out in a series of Surgeon General's reports in the 1970s and 1980s. Despite the relatively weak data supporting the dangers of second-hand smoke, these reports created an effective anti-cigarette movement based on the premise that no one has the right to impose health risks on others (Brandt, 1998). In the last 25 years, the danger of passive smoking has become an important part of the public discourse on U.S. smoking and has been framed as a conflict between the rights of smokers to smoke and the rights of non-smokers to avoid exposure to second-hand smoke (Brandt, 1998). Although there are relatively few U.S. federal laws regulating public smoking, many states, cities, and local communities and businesses have prohibited or limited smoking. In 2006 most U.S. states had passed measures limiting smoking, for example, in government worksites (state laws in 47 out of 50 states), hospitals (laws in 43 states), and restaurants (laws in 38 states) (CDC, 2007). In Florida smoking is completely banned in private and government worksites, restaurants, and commercial day care centers (CDC, 2007). In sum, in the U.S. perception of risk has played an important role in public discourse about smoking and in justifying legislation limiting or prohibiting smoking.

In Denmark, as in the U.S., individual autonomy is valued and cigarette smoking has historically been viewed as a private matter. However, the harm of passive smoker and the rights of non-smokers have not served an important role in Danish discourse about smoking. Studies by the Danish Cancer Society (focus groups conducted separately for smokers and non-smokers) revealed that neither smokers

nor non-smokers felt it was their responsibility to create a smoke free environment in their work place, either individually or as members of a group. Non-smokers also reported that they did not want to limit smokers' rights to smoke and instead coped by avoiding the topic of passive smoking and by avoiding exposure to smoke the best they could (Passiv Rygning Hvidbog, 2005). Thus, non-smokers did not frame smoking as a "rights" issue and did not identify as a group with other non-smokers. Consistent with a lack of emphasis on the dangers of passive smoking, tobacco control measures in Denmark have focused on limiting active smoking (for example, via high tobacco taxes and restrictions on tobacco advertising) as opposed to limiting passive smoking (for example, via restrictions on public smoking) (Albæk, 2004). There are currently no restrictions on smoking in bars and restaurants in Denmark (Danish Cancer Society, 2006b) and there is mixed support for potential laws limiting smoking in the work place and public places (Danish Cancer Society, 2006a). Comparing Danish tobacco control measures to those in other European countries, Joossens & Raw (2006) found that Denmark placed 18th (out of 30 countries) scoring relatively highly on advertising bans, health warnings, and treatment offering, and scoring low on public place bans and public information campaign spending (Joossens & Raw, 2006). In sum, although both the U.S. and Denmark value autonomy and individual choice in making health decisions, the risk of smoking (especially passive smoking) has played an important role in prohibitions and intolerance toward public smoking in the U.S. and less so in Denmark.

The purpose of this study was to compare the risk perceptions of young adults in a smoking-prohibitive culture (the U.S.) and a smoking-lenient culture (Denmark). We compared smokers and non-smokers with respect to their perceptions of personal risk, risk of the typical smoker, and risk of the typical non-smoker. We also examined risk perceptions as a function of smoking frequency (number of cigarettes smoked daily). Finally, we compared attitudes toward smoking. We expected that Danish and American smokers (compared with non-smokers) would acknowledge some risk associated with smoking but generally deny that they were personally at risk. Because of the greater smoking prevalence and leniency in Denmark as well as the lesser emphasis on the dangers of smoking we expected this pattern of risk minimization to be especially pronounced among the Danish young adults.

Method

Participants

The Danish sample was a convenience sample of 193 males and 82 females from Danish trade schools. The U.S. sample was a convenience sample of 136 male and 161 females from Community Colleges in Florida. The educational institutions in both countries focus on shorter (typically 2 years) trade-oriented degrees.

The average age of the Danish ($M = 22.6$, $SD = 7.78$) and US ($M = 23.6$, $SD = 7.02$) participants was equivalent. Among Danish participants 49% currently smoked cigarettes, 11% were ex-smokers, and 38% had never smoked cigarettes. For the U.S. participants these numbers were 27%, 19% and 53%, respectively. Danish and U.S. smokers were similar in the number of quit attempts ($M_s = 1.6$ vs. 1.2) and number of cigarettes per day (Danish sample: 14; U.S. sample: 13). At the time of data collection (1997/1998) national statistics show that 37% of Danes smoked (WHO, 2006) and 25% of Americans smoked (CDC, 1999).

Procedure

Participants completed the questionnaires in their classrooms. Students were told verbally and in writing that participation in the study was voluntary and anonymous. Consent was indicated by completing the questionnaire. No compensation was provided; refusals were very rare. The questionnaire was translated from Danish to English by a bilingual speaker (the author). The translation was then independently checked by two other bilingual speakers for accuracy of translation and equivalency of meaning.

Materials

Materials consisted of a questionnaire used to measure smoking habits, attitudes about smoking, beliefs about health risks, and school-related information. Participants also provided demographic information such as gender, age, educational goals, and the name of their school. Below we describe the questions used in the current investigation. Questions were in the same order in both questionnaires.

Smoking information. Smokers were asked if they smoked cigarettes with the following response options "Yes, I smoke cigarettes regularly or occasionally", "No, but I used to smoke cigarettes", "No, but I smoke cigars, smokeless tobacco (chewing or dipping) or a pipe", "No, I have never smoked cigarettes".

Participants who answered *yes* to this question were also asked if they smoked every day (and then to provide the number of cigarettes smoked daily), if they smoked at least once a week (and then to provide the number of cigarettes smoked weekly), or if they smoked less than once a week (and then to provide the number of cigarettes smoked per month). In this paper one focus was on daily smokers ($n = 191$: 55 U.S. and 136 Danish) versus never-smokers ($n = 251$: 145 U.S. and 106 Danish). Thus, participants were only include in the “daily smoking” group if they said that were smokers *and* they said they smoked cigarettes daily.

Smoking attitudes. Three items assessed attitudes towards smoking. The statements included: “Smoking makes one uncomfortable indoors and exposes others to discomforts,” “Doctors and health educators exaggerate the health dangers of smoking,” and “Smoking is a private matter that does not concern others.” Responses were recorded on a scale from 1 (*agree*) to 5 (*disagree*) and reverse coded so that higher numbers indicated more agreement.

Risk perception. Three items asked the participants to rate their personal risk, the typical non-smoker's risk, and the typical smoker's risk of getting lung cancer. For example, the typical smoker's risk question asked “What is the chance that the typical smoker (your age) will get lung cancer in his/her lifetime”. The response scale for risk perception items ranged from 1 (*not at all likely*) to 5 (*very likely*).

Results¹

Do smokers show comparative optimism? The tendency to think that you are less at risk than similar others is pervasive (Helweg-Larsen & Shepperd, 2001). Did smokers in the two countries show comparative optimism? Smokers rated their personal cancer risk ($M = 3.06$) lower than the risk of the typical smoker ($M = 3.40$), $F(1, 170) = 18.80$, $p < .001$, partial $\eta^2 = .10$, for the main effect of country in a 2 (country: U.S. vs. Denmark) x 2 (personal risk vs. typical smoker risk) mixed-model ANOVA. In addition, Danes estimated the risk of cancer as lower ($M = 3.08$) than did Americans ($M = 3.37$), $F(1, 170) = 4.94$, $p = .03$, partial $\eta^2 = .03$, for the main effect of country. Finally, Danish smokers were just as comparatively optimistic as Americans smokers, $F < 1$ for the risk target x country interaction (see Figure 1). This pattern of comparative optimism was shown in 20 out of 24 studies reviewed by Weinstein (2001).

Do smokers regard smoking as less dangerous than non-smokers regard smoking? To answer this question we examined the perceptions of smokers' risk of lung cancer. Danes ($M = 3.53$) rated

smokers' lung cancer risk as less likely than did Americans ($M = 4.09$), $F(1, 400) = 12.57$, $p < .001$, partial $\eta^2 = .03$ for the main effect of country in a 2 (Country: U.S. vs. DK) x 2 (smoking status: daily smokers vs. never smoked) ANOVA. The typical smoker's cancer risk was viewed as lower among smokers ($M = 3.33$) than among non-smokers ($M = 4.12$), $F(1, 400) = 55.02$, $p < .001$, partial $\eta^2 = .12$ for the main effect of smoking status. As seen in Figure 2, the two-way interaction was not significant, $F < 1$. Weinstein (2001) found that out of 21 studies 17 showed that smokers rated smoking as less dangerous than did non-smokers. Consistent with Weinstein's finding, smokers (compared with non-smokers) thought smokers' cancer risk was lower. This was true in both Denmark and the U.S. although Danes compared to Americans overall thought that smokers' risk of lung cancer was lower.

Do smokers rate their personal risk as greater than non-smokers rate their personal risk of lung cancer? To answer this question we examined how smokers and daily smokers viewed their personal risk of lung cancer. Smokers viewed their personal lung cancer risk ($M = 3.10$) as higher than non-smokers viewed their personal lung cancer risk ($M = 2.33$) for the main effect of smoking status, $F(1, 399) = 47.89$, $p < .001$, partial $\eta^2 = .11$ in a 2 (Country: U.S. vs. DK) x 2 (smoking status: daily smokers vs. never smoked) ANOVA. There was no main effect of country ($F < 1$) but there was an interaction of smoking status and country, $F(1, 399) = 13.86$, $p < .001$, partial $\eta^2 = .03$. Among smokers, Danes saw their personal risk as lower ($M = 2.92$) than Americans did ($M = 3.27$), $F(1, 172) = 4.80$, $p = .03$, partial $\eta^2 = .03$, but among non-smokers, Danes ($M = 2.57$) saw their personal risk as higher than did Americans ($M = 2.09$), $F(1, 169) = 10.65$, $p = .001$, partial $\eta^2 = .05$. Said differently, Americans non-smokers and smokers viewed their personal lung cancer risk more differently ($M = 1.18$, partial $\eta^2 = .20$) than did Danes ($M = 0.35$, partial $\eta^2 = .05$); see Figure 3. Most studies find that smokers acknowledge that smokers are more at risk than non-smokers; all nine studies reviewed by Weinstein (2001) replicated this finding. In conclusion, both Danish and U.S. smokers rated their personal risk as greater than non-smokers rated their personal risk. However, this pattern was more pronounced for U.S. smokers than Danish smokers.

Do heavy smokers report greater risk? The purpose of these analyses was to examine the relationship between smoking frequency (number of cigarettes smoked daily) and risk perceptions among daily smokers. First, examining personal risk perceptions among Danish smokers there was no

relationship between how much they smoked and how much at risk they thought they personally were, $r(117) = .08, p = .38$. Among U.S. smokers, the more they smoked, the higher their perceptions of being personally at risk, $r(44) = .41, p = .006$. This relationship is exhibited in Figure 4 which shows the personal risk estimate among Danish and U.S. smokers for smokers with various smoking frequencies (less than 10 cigarettes a day, between 11 and 19 cigarettes a day, and more than 20 cigarettes a day). Second, examining perceptions of non-smoker's risks, both Danish and U.S. smokers saw the risk of non-smokers as greater the more they smoked themselves although this relationship was stronger among U.S. smokers, $r(44) = .37, p = .01$, than among Danish smokers, $r(115) = .19, p = .04$. Perhaps smokers were justifying their personal risk by also assuming elevated risks of non-smokers (e.g., "I'm taking a risk by smoking but anyone, even non-smokers, could get lung cancer"). Third, neither in Denmark, $r(117) = -.04, p = .64$, or the U.S., $r(42) = .02, p = .89$, was the amount of smoking correlated with the risk perceptions of the typical smoker. In sum, in the U.S. the more smokers smoked the more they thought they were personally at risk and the more they thought non-smokers were at risk but smoking frequency was not related to the risk of the typical smoker. In Denmark the more smokers smoked the more they thought non-smokers were at risk (although this relationship was weaker than among U.S. smokers), but smoking frequency was not related to their personal risk (that is, Danes did not see a link between their smoking amount and their personal cancer risk) or the risk of the typical smoker.

Do Danes have more favorable attitudes toward smoking? We asked three questions about smoking and examined the responses for each question by conducting a 2 (smoking: non-smoker vs. daily smoker) x 2 (country: U.S. vs. Denmark) ANOVA. As seen in Figure 5, smokers had more positive attitudes toward smoking than non-smokers ($ps < .001$) and Danes had more positive attitudes toward smoking than Americans ($ps < .01$). In addition to these main effects, the third question (*smoking is a private matter that does not concern others*) showed a significant interaction, such that although in each country smokers agreed with this statement more than non-smokers did, the distance between smokers ($M = 3.77$) and non-smokers ($M = 2.19$) in the U.S., $F(1, 180) = 53.43, p < .001$, partial $\eta^2 = .23$ was greater than the distance between smokers ($M = 4.21$) and non-smokers ($M = 3.49$) in Denmark, $F(1, 224) = 17.93, p < .001$, partial $\eta^2 = .07$. That is, Americans smokers and non-smokers disagreed more on smoking being a private matter ($M = 1.58$, partial $\eta^2 = .23$) than did Danish smokers and non-smokers (M

= 0.72, partial $\eta^2 = .07$). In sum, Danes (compared with Americans) and smokers (compared with non-smokers) believed to a greater extent that smoking does not make others uncomfortable, that doctors exaggerate the dangers of smoking, and that smoking is a private matter.

Discussion

The comparison of Danish and U.S. daily smokers and non-smokers revealed three cross-cultural differences suggesting that Danish smokers compared to U.S. smokers engaged in greater risk minimization about their smoking risks. First, daily smokers from both the U.S. and Denmark indicated that lung cancer risk was greater for smokers than non-smokers. However, the effect was smaller among Danes such that Danish smokers did not see smoking to be as dangerous as did U.S. smokers. Second, when examining the relationship between personal risk of lung cancer and smoking frequency (number of cigarettes smoked daily), the more U.S. smokers smoked, the greater they saw their personal risk. Among Danish smokers there was no relationship between smoking frequency and personal risk. That is, Danish smokers did not perceive that their personal lung cancer risk was increased when smoking more cigarettes. Third, attitudes toward smoking differed in that Danes had more favorable attitudes toward smoking than did Americans. Danes believed to a greater extent that smoking is a private matter, that doctors exaggerate the dangers of smoking, and that smoking does not make others uncomfortable. In sum, the cross-cultural differences showed that Danes more so than Americans minimized the risks of smoking.

We also found evidence for cross-cultural similarities. Both Danish and American smokers saw their personal risk as lower than they saw the risk of a typical smoker. In addition, when estimating the lung cancer risk of a typical smoker both Danish and American smokers saw this risk as lower than non-smokers did. These two findings replicate Weinstein's (2001) conclusions from a review of the literature and suggest that smokers (U.S. and Danish) do not fully acknowledge their personal risk of smoking.

Considerable research has focused on the extent to which smokers realistically perceive the risks they take (e.g., Romer & Jamieson, 2001a). The present results suggest that although smokers see the risks of the typical smoker as greater than the risk of the typical non-smoker, in general, smokers minimize or deny their smoking risks. Furthermore, Danes perceive fewer risks than Americans perceive. Two interesting findings are worth mentioning with respect to the relationship between smoking frequency

(the number of cigarettes smoked daily) and risk estimation. First, U.S. smokers estimated their personal risk as greater the more cigarettes they smoked. This certainly appears realistic given the well-established dose-response relationship between smoking frequency and health risks (Samet, 2001). In a U.S. nationally representative sample of smokers, results also showed that greater smoking frequency was significantly related to personal risk perception but interestingly smokers still vastly underestimated their actual risk associated with increased smoking (Weinstein et al., 2005). That is, smokers thought they were slightly more at risk for cancer the more they smoked but actually they were at vastly greater risk the more they smoked. In the present study we can conclude that although the Danish smokers minimized their risk more so than American smokers, it is likely that even the American smokers underestimated their actual risk.

Second, in the present study smokers also perceived the typical *non-smoker's* risk as greater the more cigarettes they smoked. Why would smokers come to believe that non-smokers are at greater risk the more cigarettes they themselves smoke? One explanation is cognitive dissonance. Accepting that one's behavior is likely to cause harm to one's health is likely to arouse discomfort or cognitive dissonance among smokers. To reduce that discomfort smokers might subscribe to a host of dissonance reducing beliefs. These types of beliefs were documented in a study of self-exempting beliefs among smokers (Oakes, Chapman, Borland, Balmford, & Trotter, 2004). Self-exempting beliefs among smokers were distributed into four categories: "bulletproof" (belief that you are personally invulnerability to risk), "skeptical" (belief that the dangers of smoking are exaggerated), "worth it" (belief that the benefits exceed the costs), and "jungle" (belief that there are inherent danger in living). The "jungle" beliefs included items such as "everything causes cancer these days," "it is dangerous to walk across the street," and "smoking is no more risky than lots of other things that people do". These categories of beliefs were prevalent among smokers and each predicted progression toward planning to quit. In the present study among U.S. smokers, frequency of smoking was associated with increased personal risk perception and increased risk perception of the typical non-smoker. Among Danish smokers frequency of smoking was associated only with increased risk perception of the typical non-smoker. One way of taking the sting out of acknowledging personal risk is to believe that lung cancer has many causes other than smoking and that everyone is probably equally at risk for lung cancer.

Why do Danish and U.S. smokers and non-smokers differ in how dangerous they perceive smoking? One intriguing possibility concerns individual and cross-cultural differences in moralization of smoking. An edited volume, *Morality and Health* (Brandt & Rozin, 1997) documents the history and development of moralization, and the individual and cultural process by which preferences are converted into values. Simply put, a behavior is moralized when it is considered inherently bad and not simply a personal choice or preference. Rozin (1999) argues that over the past 30-40 years, smoking has become a behavior which people in the U.S. regard as a moral act rather than a personal choice. Moralization is important because *values* as opposed to *preferences* are more durable, more central to the self, and more internalized (Rozin, 1997). Furthermore, values are more likely to receive institutional and legal support (Rozin, Markwith, & Stoess, 1997). In fact, once moralization on an issue has received support in powerful segments of the population, government and other institutions align with the moralized perspective and create or support regulations against the moralized entity (Rozin & Singh, 1999). One would therefore expect that countries with greater moralization about smoking also have more tobacco control measures. Consistent with this reasoning, the U.K. has more tobacco control measures in place than Greece (Joossens & Raw, 2006) and U.K. smokers moralize more than Greek smokers (Louka, Maguire, Evans, & Worrell, 2006).

The evidence in the present study suggests that Danes thought smoking was less dangerous than did Americans. In addition, the present study points to the lesser moralization of smoking among Danes. Danish smokers were more likely than U.S. smokers to agree that smoking is a private matter, an attitude that is contradictory to a moralized view of smoking. The pattern among the Danes was noteworthy in that Danish non-smokers and smokers were more similar in their attitudes than U.S. non-smokers and smokers (in fact, Danish non-smokers were most similar to U.S. smokers on this question, see Figure 3). Consistent with the present finding that smoking is an entity that is less moralized among Danes than among Americans, Albæk (2004) in describing Danish tobacco control policies states that "The individual's decision to smoke is not (yet) considered morally objectionable" (p. 215). Future research should examine, at the individual and cultural level, the relationship between moralization and risk perception and the possibility that high level of moralization is associated with a greater number of private and public sources of health information communicating that smoking is dangerous.

The present research replicates and extends research on risk perceptions of smokers. However, this study was not without limitations. One limitation is that the participants were not representatively sampled and we can therefore not generalize these findings to the population as a whole. In addition, we do not know if the participants were necessarily native to the country in which they were enrolled in classes. Participants might have come from several countries, although we describe them here as Danish and U.S. participants. Future research should also longitudinally link risk perceptions to moralization (as discussed earlier) and to behavioral intentions to limit or quit smoking.

Believing that smoking is not that dangerous might be an important mechanism by which smokers can justify continued smoking. Indeed most major theories of health behavior change include an element of risk acknowledgement as a precursor to behavioral change. For example, the Precautionary Adoption Model proposes that before people take action to attenuate a health risk, they must first recognize the risks associated with their behavior (Weinstein, 2000). In a nationally representative sample of U.S. smokers, results showed that among adult smokers (but not among adolescent smokers) personal risk perception was predictive of fewer cigarettes smoked and a greater number of quit attempts (Romer and Jamieson, 2001b). Risk perceptions also played an important role in a study of smokers at a smoking cessation clinic and in the community. Here results showed the highest perception of smoking risk among smokers at the clinic and the lowest among smokers in the community (McCoy, Gibbons, Reis, Gerrard, & Sufka, 1992). Before people will change their behavior in a health protective direction they must believe the problem is serious and that they are vulnerable (McCoy et al., 1992). One cross-cultural consistency is perhaps that a more accurate understanding of one's personal health risks of smoking might contribute to increased willingness to quit.

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Figure Captions

Figure 1. Daily smokers' perception of their personal risk and the typical smoker's lung cancer risk.

Figure 2. Perception of the typical smoker's risk among Danish and U.S. smokers and non-smokers.

Figure 3. Personal risk perception among Danish and U.S. smokers and non-smokers

Figure 4. Daily smokers' perception of their personal lung cancer risk as a function of smoking frequency
(the number of cigarettes smoked daily)

Figure 5. Smoking attitudes as a function of country (United States or Denmark) and smoking status
(daily smokers or non-smoker).

Figure 1.

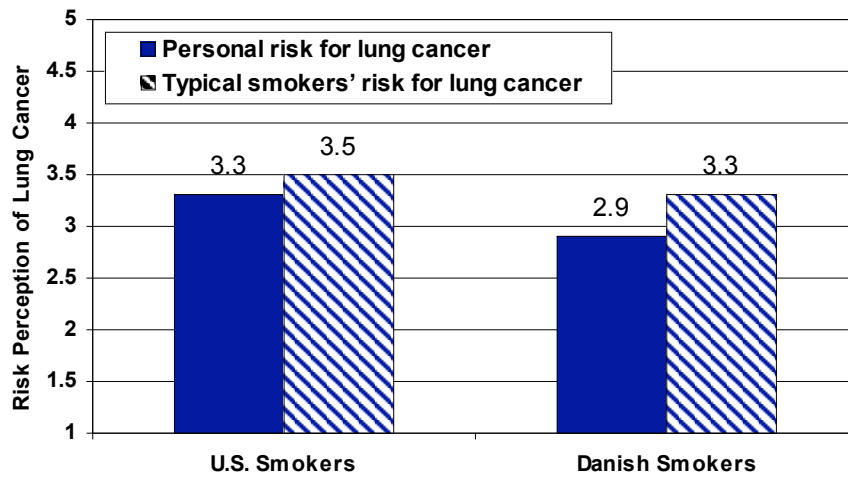


Figure 2.

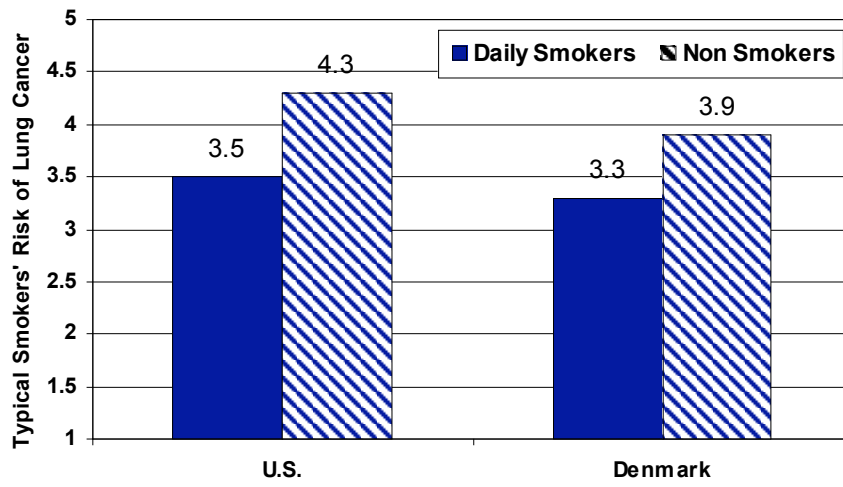


Figure 3.

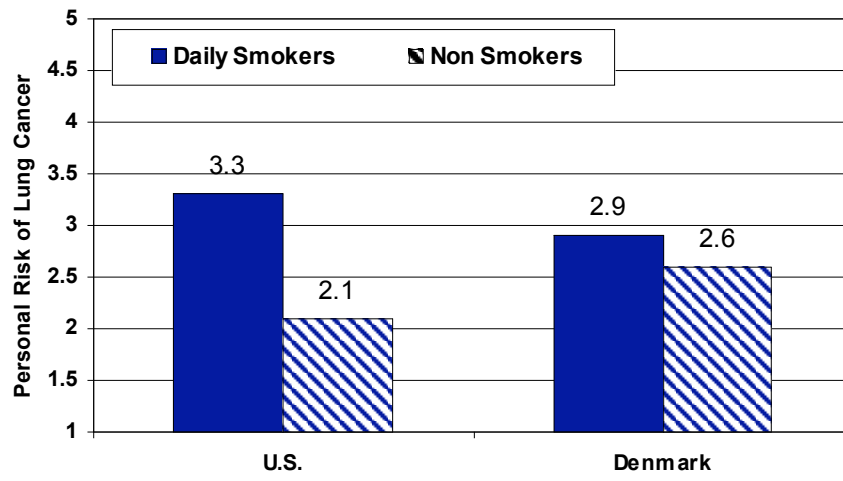


Figure 4

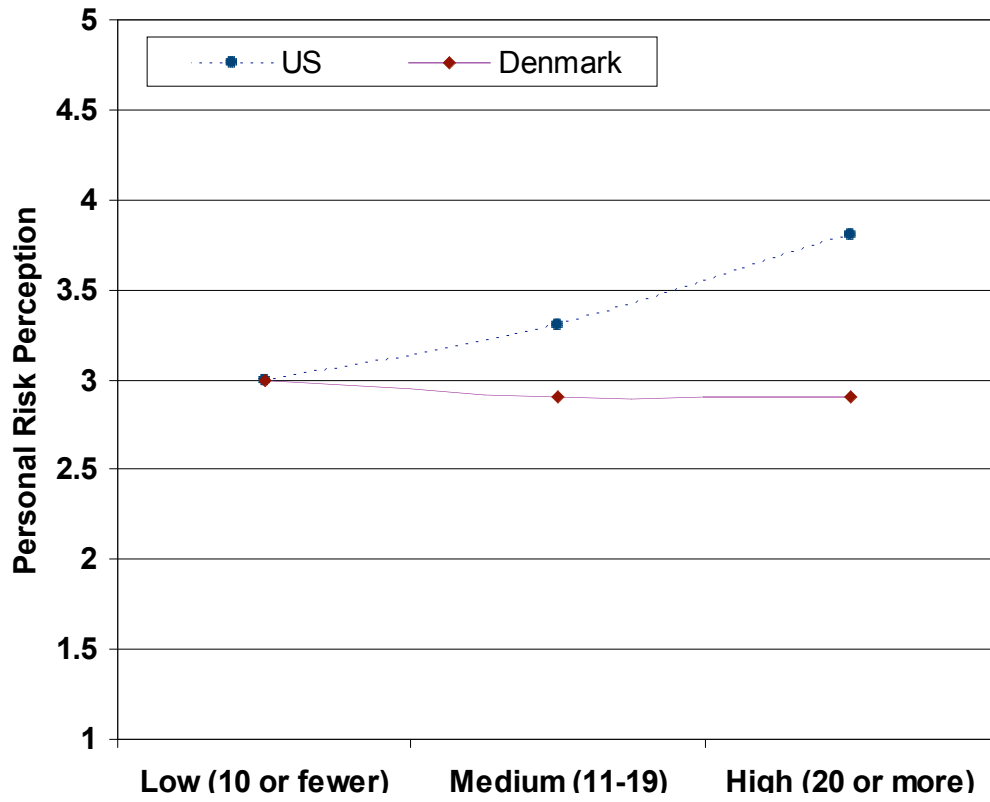
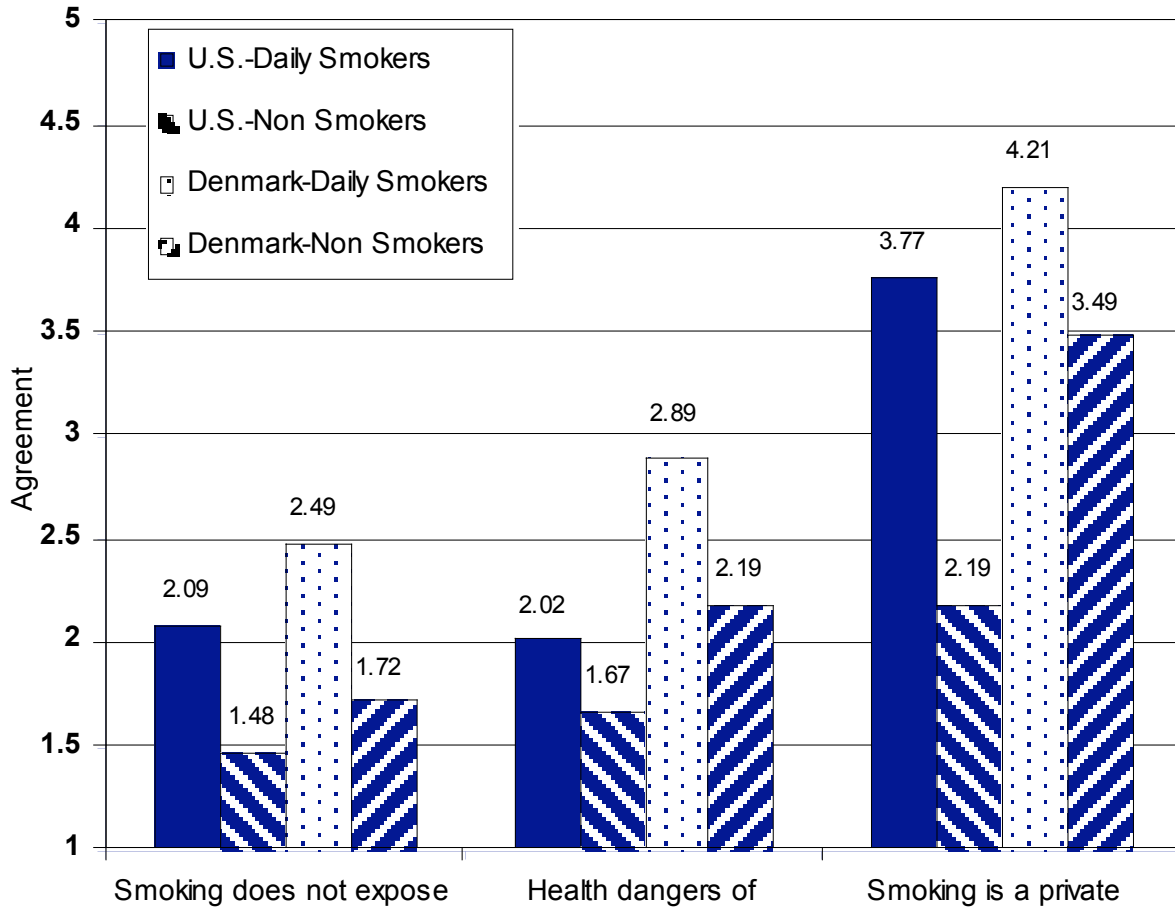


Figure 5



Footnotes

¹ There are no theoretical reasons for expecting gender differences in smoking risk perceptions; in fact the literature on risk perception rarely shows gender differences. However, because there were relatively more men in the Danish sample (70%) than in the U.S. sample (46%) we examined the possibility that gender interacted with country of origin for each of the three primary dependent variables: personal risk, non-smoker risk, and smoker risk. A 2 (gender) x 2 (country) ANOVA was conducted for each of the three dependent variables. Results revealed no main effects of gender or country x gender interactions ($ps > .16$). Therefore, the analyses did not further examine gender.