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How Do People Resolve Conflict Between Implicit and Explicit Attitudes?

How do implicit attitudes influence behavior when they are in conflict with explicit attitudes? In Study 1, smokers' negative implicit attitudes and positive explicit attitudes towards smoking were activated. Then emotions were measured. The stronger the negative implicit attitudes that the smokers held, the stronger the conflict experienced. Study 2 showed that cognitive capacity allows for this conflict, as positive explicit and negative implicit attitudes may be applied simultaneously. The stronger the negative implicit attitudes the smokers held, the stronger the conflict experienced. Smokers resolved the conflict through the inhibition of implicit attitudes (by smoking cigarettes). Without cognitive capacity, only implicit attitudes were applied, and thus no conflict was aroused. Study 3 confirmed that smoking cigarettes inhibited negative implicit attitudes.

Keywords: *implicit attitudes, Implicit Association Test, cognitive capacity, influence of attitudes on behavior*

The concept of attitude was introduced into social science by William Thomas & Florian Znaniecki in 1918 in the book "The Polish peasant in Europe and America". It became quickly so popular that in the 1930s Allport (1935) described attitude as the "most distinctive and indispensable concept of social psychology" (p. 798). An attitude is most commonly defined as a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly & Chaiken, 1993; Wojciszke, 2000). The unique sense of an attitude, according to Allport, was that it predicts behavior. However, researchers faced the problem of low predictive validity of the attitude construct. Kraus' meta-analysis (1995) of 88 studies on attitudes and behavior showed a correlation of $r=0.38$ between attitude and behavior. This is a mean correlation, which indicates that it was stronger in some of the studies and weaker in others. Therefore, it was important to find out which characteristics cause its stronger connection to behavior. The results of the studies suggested that the link between attitude and behavior is stronger when, among other things, the attitude is easily accessible (Fazio, 1986), a person is aware of his or her attitude (Eagly & Chaiken, 1993), a person perceives a link between his or her attitude and behavior (Fishbein & Ajzen, 1974), the attitude refers to a specific behavior (Davidson & Jaccard, 1979), and when beliefs that are the source of

the attitude are consistent (Ajzen & Sexton, 1999).

Greenwald and Banaji (1995) weakened the assumption that a person must be aware of an attitude in order for the attitude to affect behavior. They proposed the concept of implicit attitude and defined it as "introspectively unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects" (p 8). Greenwald & Banaji (1995) hoped that the introduction of the concept of implicit attitude would lead to a satisfactory solution to the problem of attitude predictability. Thanks to this definitive innovation, the concept of attitude regained its status as social psychology's "most indispensable concept" (Greenwald & Banaji, 1995).

The first research projects inspired by this new idea spectacularly displayed the way that the implicit attitude differs from the classically understood, conscious (explicit) one. For example, Greenwald, Schwartz, and McGhee (1998) observed that explicit attitudes declared by white Americans towards their in-group were as positive as those towards African-Americans. However, when their implicit attitudes were measured, it was proven that they preferred the in-group to the out-group. Analogous differences between explicit attitude declared in the questionnaire and implicit attitude could also be observed in the case of attitudes towards women and men (Rudman, Greenwald,

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& McGhee, 2001), elderly people (Karpiński & Hilton, 2001), smoking (Swanson, Rudman, & Greenwald, 2001) and homosexuals (Banse, Seise, & Zerbes, 2001). The observed differences suggest that implicit attitude can be the “real” attitude, or the specific “polygraph” (Nosek & Banaji, 2002). That is why there was an expectation that implicit attitude would explain behavior that could not be predicted by explicit attitude.

The results of previous studies did not confirm those predictions because they showed that the attitude – behavior correlation was weaker for the implicit attitude than for the explicit one. For example, Karpinski and Hilton (2001) noted that the link between implicit attitude and behavior, the choice of either an apple or a chocolate bar as a reward for taking part in the experiment, was weaker than the link between explicit attitude and the same behavior.

But the reason for obtaining results showing a weak predictability of implicit attitude could be that no behavior specific to the attitude was studied (Marsh, Johnson, & Scott –Sheldon, 2001). McConell and Leibold (2002) hypothesized that because of its unconscious source, the implicit attitude would be strongly connected to “spontaneous” behavior conducted without effort or control of an individual, whereas the explicit attitude would correlate strongly with “deliberate” behavior resulting from a test subject thinking over the situation.

Their experiment aimed at verifying this hypothesis by studying the correlation between both implicit and explicit attitudes and behaviors of white Americans at the time of conversation with an African-American experimenter. The study showed that the stronger the negative implicit attitudes that whites displayed toward blacks, the more negative spontaneous reactions towards the African-American experimenter the whites displayed (e.g. shorter speaking time, less smiles, more speech errors).

Stronger connections between implicit attitudes and “spontaneous” behavior suggest that implicit attitudes can be a viable predictor of behavior that is not influenced by explicit attitudes. Moreover, this means that not only should the aim of research be to state whether or not the implicit attitude predicts behavior, but also identifying the conditions of such influence. Naturally, these concerns raise some essential questions such as, “What kind of behavior is influenced by this attitude?” and “Under what conditions does it predict behavior?”

When do implicit attitudes influence behavior?

Wilson, Lindsey, and Schooler (2000) assumed that explicit attitudes require motivation and capacity to be retrieved from memory. As a result, explicit attitudes influence behavior when a subject has an opportunity to think about his/her attitude’s object. However, when a subject has no motivation or capacity, he or she cannot apply explicit attitudes to their behavior. As a result, implicit

attitudes can influence reactions towards an object because they are activated automatically and require no capacity to guide the reactions.

To better understand this prediction, it is useful to provide an example. Let’s imagine that a smoker watches an antismoking public service announcement. When the subject has the cognitive capacity to think about antismoking arguments, they may defend their positive explicit attitudes and downplay or rationalize the negative aspects of smoking (e.g. “my father smoked 30 years and did not contract cancer”). But he or she can not produce rationalizations when they watch an antismoking PSA and at the same time the additional activity absorbs their cognitive resources (i.e. talking to someone). In this situation, negative implicit attitudes are activated and influence his or her behavior.

These predictions raise two important questions. Do implicit attitudes influence behavior when people have the capacity to think about them? The answer to this query is that they are activated automatically and not always overridden by explicit attitudes. Implicit attitudes may influence spontaneous, uncontrollable responses even when people can think about their attitudes (Bargh, 1999; Fazio, Jackson, Dunton, & Williams, 1995; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; McConell & Leibold, 2002; Wilson et al., 2000).

As cognitive capacity may allow for implicit and explicit attitudes to be activated and to act simultaneously, it is important to analyze the relationship between them. They may be in conflict: smokers have negative implicit attitudes and positive explicit attitudes towards smoking (Swanson, Rudman, & Greenwald, 2001). Aware of this conflict, one might be tempted to ask, “Do they experience conflict (shame, guilt) when their negative implicit attitudes and positive explicit attitudes are activated at the same time?”

Research by Cunningham, Johnson, and Raye (2004) suggests that there does exist conflict between implicit and explicit attitudes. Whites viewed subliminal (per 30 ms, unconscious process) and supraliminal (per 525 ms, conscious process) black and white faces while being scanned using fMRI. When participants had no opportunities to think about the object (30 ms), greater amygdala activation was observed (indicator of negative affect) while they were presented with black faces opposed to white faces. Amygdala activation correlated with implicit attitudes ($r=0.79$): the more negative implicit attitudes whites held towards blacks, the stronger the observed amygdala activation. There was no relationship of presentation to amygdala activation when whites had time to retrieve their explicit attitudes.

Instead, there was observed activation in ventrolateral prefrontal cortex and anterior cingulate – areas associated with inhibition, control, and conflict. An activation of egalitarian, explicit attitudes presumably resulted in conflict with negative implicit attitudes. To resolve this conflict,

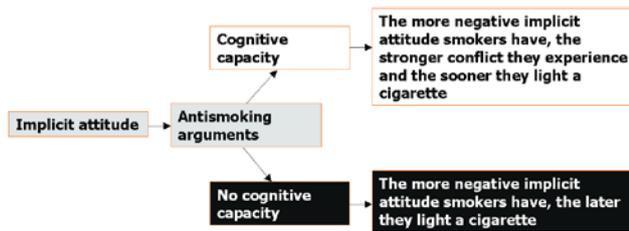


Figure 1. Relationship between implicit attitudes and behavior.

whites might inhibit unwanted, negative implicit attitudes (associated with negative feelings).

The present study examined: 1) whether or not people experienced conflict (guilt, shame) when inconsistent implicit and explicit attitudes are activated at the same time; and 2) what are the consequences of this conflict on a behavioral level. The subjects of this research were selected smokers. They had negative implicit attitudes and positive explicit attitudes (Swanson et al., 2001). I presumed that when smokers had no cognitive capacity, they could not retrieve explicit attitudes and there would be no conflict. Opposite results were expected in the cognitive capacity condition. It allowed for conflict as positive explicit (I like smoking) and negative implicit (smoking=death) attitudes may be activated simultaneously for, example by anti-smoking arguments. So I hypothesized that after watching them the more implicit negative attitudes smokers have, the stronger the conflict they experience (guilt, shame). They may resolve this conflict by overcompensating for (inhibition) negative implicit attitudes (smoking=cancer). I predicted that the more negative attitudes smokers have, the sooner they light a cigarette, see Fig 1.

STUDY 1

The goal of the current research was to examine if smokers experience a conflict when negative implicit and positive explicit attitudes are activated at the same time by antismoking arguments. I predicted that the more negative implicit attitudes they have, the stronger the conflict they feel. Non-smokers were chosen as the control group. They have both negative implicit and explicit attitudes, so no relationship between implicit attitudes and conflict was expected after watching anti-smoking arguments.

Method

Research Participants

Forty-two smokers and forty-two nonsmokers participated in this research. More than half were students (58%), 51% females and 49% males, at the average age of 22.5 years; $SD=2.9$. Most of the smokers (71%) smoked regularly, about 10 cigarettes per day ($SD=6.9$) for approximately 5.5 years ($SD=3.3$).

Independent and dependent measure

Implicit attitudes. Implicit attitudes were measured by the Implicit Association Test (Greenwald et al., 1998). In the IAT, participants classified target concepts (represented by smoking and non-smoking exemplars) and attributes (pleasant and unpleasant words) into categories. Discriminations were performed by assigning one category to the left hand and the other to a response signified by the right hand. First, participants classified pictures (target concepts) as either smoking or non-smoking. Pictures were taken of common household scenes and the smoking exemplar depicted had a cigarette and ashtray present. The nonsmoking version was analogous, but cigarettes were substituted for vegetables and fruits (e.g. carrots).

The second task required that subjects classify words as either pleasant or unpleasant (evaluation). The third task involved the combination of categories (i.e. smoking pleasant vs. non-smoking unpleasant) and their respective stimulus (words and pictures) as they appeared on alternative trials. In the fourth task, target categories were presented in reversed sides of the computer screen (i.e. non-smoking vs. smoking). In the fifth task, again there were combined categories, but they were presented in a reversed combination (i.e. non-smoking pleasant vs. smoking unpleasant). The third and fifth tasks were critical. The difference between response latencies served as a measure of implicit attitudes. For subjects with negative implicit attitudes, the “non-smoking pleasant vs. smoking unpleasant” task was expected to be easier and performed more rapidly than the “smoking pleasant vs. non-smoking unpleasant” task (more difficult and performed slower).

In terms of IAT experimental design, the current research followed the procedure used by Greenwald et al. (1998) and Swanson et al. (2002). Please see these paper for further details.

Explicit attitude. Participants were asked to indicate their attitudes towards smoking on 4 scales (9-point semantic differential: does not like it – like it, unpleasant – pleasant, non-appealing – appealing, healthy - unhealthy).

Negative emotions. Participants were instructed to reflect their feelings: contempt, hostility, abomination, shame, guilt, sorrow, anger, fear (semantic differential, 1 – very soft, 9 – very strong).

Procedure and stimulus materials

All participants were tested individually. Smokers and nonsmokers were recruited randomly on the street. Recruited subjects then filled out a pen-and-paper measure of explicit attitudes. After that, they performed the Implicit Association Test. Then, participants were presented with six antismoking arguments (time was not limited): smoking threatens health, causes heart diseases, causes lung cancer, unpleasant smell of hair, yellow coating on teeth, stale breath. They wrote briefly what they thought about each

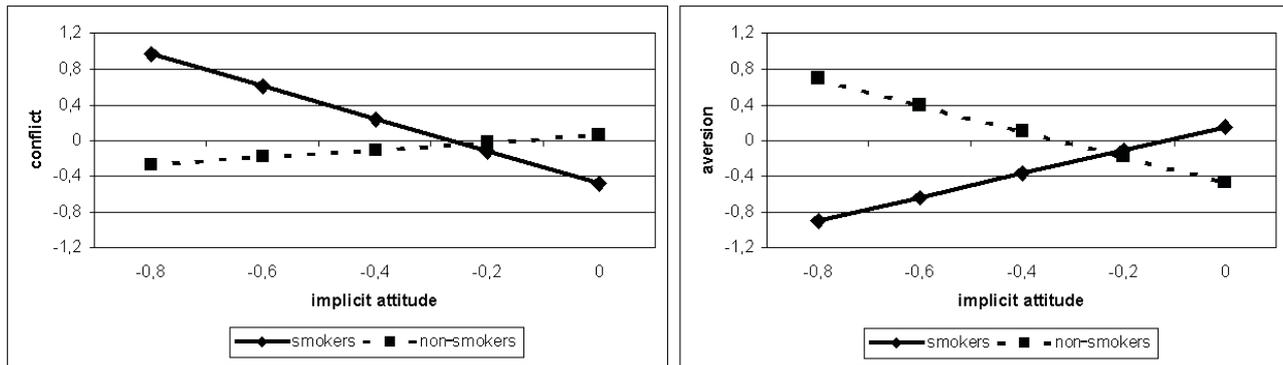


Figure 2. On the left – conflict predicted by an interaction between implicit attitudes and smoking; on the right – aversion predicted by an interaction between implicit attitudes and smoking; OX – the smaller the value, the stronger the negative implicit attitudes.

argument and recorded their emotions after watching all arguments. Finally, they were debriefed and thanked.

Results

Implicit and explicit attitudes towards smoking

Following data preparation used by Greenwald et al. (1998), latencies of less than 300 ms and greater than 3000 ms were recoded as 300 ms and 3000 ms. Then the log was transformed to normalize the distribution.

Smokers performed more rapidly in the “non-smoking pleasant vs. smoking unpleasant” task than in the “smoking pleasant vs. non-smoking unpleasant” task, which indicated the presence of negative implicit attitudes towards smoking, with an average IAT effect= -384 ms, $SD=265$, $t(41)=10.71$, $p<0.001$. Their explicit attitudes were rather positive ($M=5.8$, $SD=1.5$, on a 9-point scale). Non-smokers had both negative implicit (IAT effect= -578 ms, $SD=343$, $t(41)=12.98$, $p<0.001$) and explicit attitudes towards smoking ($M=1.6$, $SD=1.6$).

Smokers had more positive explicit ($F(1,83)=178$, $p<0.001$, $\eta^2=.68$) and implicit attitudes ($F(1,83)=11.9$, $p<0.001$, $\eta^2=.13$) towards smoking than non-smokers.

Relationship between implicit attitude and emotions

Each subject’s ratings on the 8 emotion items were submitted to a principal-axis factor analysis with Varimax rotation (Eigen Values >1). A two factor solution accounted for 70% of the total variance. Factor 1 accounted for 52% of variance and included following items: guilt (0.91), shame (0.85), sorrow (0.81), anger (0.77), fear (0.57). It was interpreted as a “conflict”. Factor 2 was labeled an “aversion”. It accounted for 18% of variance and included three items: contempt (0.88), hostility (0.85), abomination (0.71).

To find predictors of these two factors, hierarchical regression analyses (stepwise) were computed in which independent variables were smoking, implicit attitudes, explicit attitudes and two interactions: smoking x implicit attitudes, smoking x explicit attitudes. For the equation

representing experienced conflict, the only significant predictor was interaction between smoking x implicit attitudes $\beta=0.23$, $p=0.03$. The more negative implicit attitudes smokers held, the stronger the conflict they experienced, $\beta=0.38$, $p=0.014$. As predicted, there was no significant relation for non-smokers, $\beta=-0.12$, $p=0.44$, see Fig 2.

For aversion (factor 2), the significant predictor was again interaction between smoking and implicit attitudes, $\beta=-0.34$, $p=0.001$. The more negative implicit attitudes smokers had, the weaker the aversion they declared, $\beta=0.35$, $p=0.021$. For non-smokers, the relation was reversed: the more negative implicit attitudes held, the stronger the aversion they declared, $\beta=-0.36$, $p=0.019$. The second significant predictor was smoking, $\beta=0.32$, $p=0.002$. Non-smokers felt a stronger aversion than smokers did.

Discussion

Results confirmed that the more negative attitudes smokers held, the stronger the conflict they felt (guilt, shame). They suggested that anti-smoking arguments probably activated negative evaluations that are downplayed by smokers and were a source of their negative implicit attitudes (smoking=death). At the same time smokers applied their positive attitudes (I like smoking). Inconsistency between implicit negative associations (smoking=cancer) and positive attitudes (I like smoking) might be threatening for self of smokers and evokes guilt, shame. It appeared that the more negative implicit evaluation smokers held, the stronger the conflict they felt (guilt, shame). Non-smokers had both negative implicit and explicit attitudes, so as predicted, there was no relationship between implicit attitudes and conflict.

The relationship between implicit attitudes and aversion suggested that smokers might resolve aroused conflict by overcompensating for implicit attitudes. The more negative implicit attitudes they had, the weaker the aversion towards anti-smoking arguments they declared. Non-smokers did not need to inhibit implicit attitudes because it was

consistent with their explicit attitudes. Therefore, the more negative implicit attitudes they held, the stronger the aversion towards anti-smoking arguments they declared.

Analogous results were observed by Fazio et al. (1995). They measured the white subjects' implicit attitudes towards blacks by priming procedure and explicit attitudes using the Modern Racism Scale. The third measure used was the motivation to respond without prejudice. When motivation was low; the stronger the negative implicit attitudes whites had, the more prejudice they declared. The results were reversed when whites had strong motivation to respond without prejudice; the stronger the negative implicit attitudes whites had, the less prejudice they declared. These declarations might serve as a way to inhibit unwanted, automatic negative attitudes. Similarly, smokers might have strong motivation to inhibit implicit negative associations (smoking=cancer), activated by anti-smoking arguments, because they caused a conflict, so they overcompensated for it.

STUDY 2

Study 1 fulfilled the prediction that activation of negative implicit attitudes by anti-smoking arguments arouses conflicted reactions. However, these results were observed when smokers had the cognitive capacity to think about those arguments. Study 2 tested if such a conflict would be experienced when a smoker's cognitive resources were absorbed by an additional task. I predicted that cognitive activity would not allow smokers to apply their explicit attitudes, so they would not feel conflict.

Study 1 suggested that smokers might overcompensate for their implicit attitudes. To prove this point, I attempted to provide a demonstration of the behavioral consequences of that overcompensation. So I predicted that when smokers had the cognitive capacity to think about antismoking arguments, and they held more negative implicit attitudes, they would sooner light a cigarette. The opposite results were expected when an additional task absorbed the smokers' cognitive resources. The more negative implicit attitudes they held, the later they lit a cigarette after viewing antismoking arguments.

Method

Research participants and design

Eighty-two smokers participated in this research. Most of them were students (80%), 50% of test subjects were females and 50% were males with an average age of 21 years, $SD=2.9$. Participants smoked 12.2 cigarettes per day (on average; $SD=7.6$), for approximately 4.5 years ($SD=2.1$).

The independent variables were cognitive business (busy vs. not busy), implicit attitudes, and explicit attitudes.

Dependent measure

Participants evaluated six antismoking arguments. Each of the arguments were presented for 15 seconds on a computer screen. On the bottom of the screen was a graphic scale anchored on the left with the option "it is not convincing at all", and the option "it's fully convincing" on the right. After 15s, the subjects were prompted with instructions to "evaluate argument," and participants had 5s to do so. They were then required to choose the point on the scale which fit best and click it. Then, the next argument was presented and participants evaluated it in the same way as the previous one.

Measures of emotions as well as explicit and implicit attitudes were identical to those found in Study 1.

Procedure and stimulus material

Smokers were recruited on the street. Only those who had cigarettes with them were asked to participate in the research and were guided to the laboratory. After their arrival, smokers filled a pen-and-paper measure of explicit attitudes and completed the Implicit Association Task.

Following the trial task (arguments persuading not to give money to beggars on the street), they were presented with six antismoking arguments (the same ones used previously in Study 1).

A female experimenter randomly assigned participants to one of the two treatment conditions: 1) cognitively busy – while being presented with antismoking arguments, the smokers were performing an additional task absorbing cognitive resources (counting down loudly from 100 to 1) and 2) not busy – no additional task.

After measuring emotions, participants were asked to stay for 5 minutes in the corridor outside the laboratory. The experimenter explained that 5 minutes were needed to fill out the bill for participation and to prepare the laboratory for the next participant. In the corridor was a selected area for smoking (it had existed for many years; there was a large ashtray). Smokers were observed to see if they smoked cigarettes and in what time after leaving the laboratory. They were then debriefed and thanked.

Results

Implicit and explicit attitudes towards smoking

First, preparation of the IAT data was performed, identical to that in Study 1. Four participants were excluded from the analysis because they made more than 30% errors in the IAT (following a suggestion by Greenwald et al., 1998). Smokers performed more rapidly "non-smoking pleasant vs. smoking unpleasant" tasks ($x=921$ ms) than

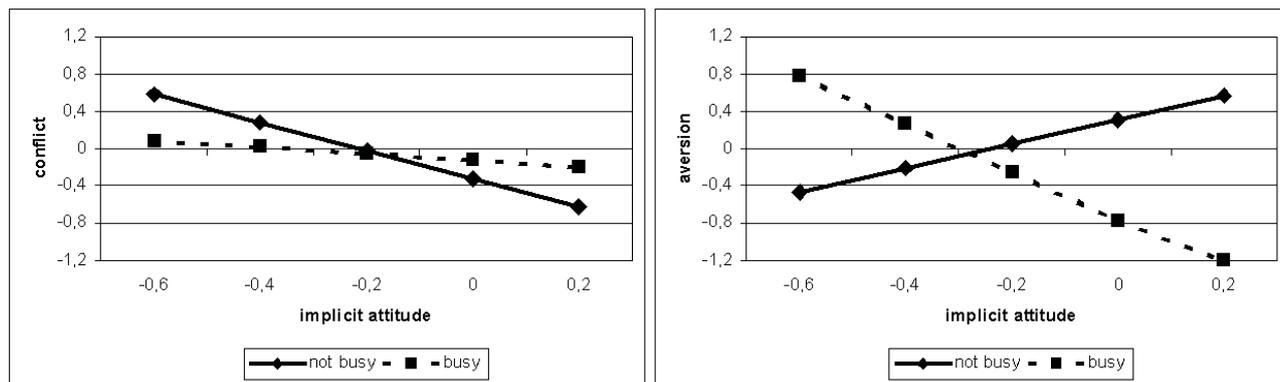


Figure 3. On the left – conflict predicted by an interaction between implicit attitudes and cognitive capacity; on the right – aversion predicted by an interaction between implicit attitudes and cognitive capacity; OX – the smaller the value, the stronger the negative implicit attitudes.

“smoking pleasant vs. non-smoking unpleasant” tasks ($x=1215$ ms), which indicated negative implicit attitudes towards smoking, with an average IAT effect of $x=-384$ ms, $SD=306$, $t(77)=8.55$, $p<0.001$. Their explicit attitudes were neutral ($M=4.99$, $SD=1.3$, on 9-point scale).

Evaluation of antismoking arguments

To test the effectiveness of the experimental manipulation, hierarchical regression analyses (stepwise) were computed in which independent variables were cognitive business (not busy vs. busy), implicit attitudes, explicit Attitudes, and two interactions: cognitive business x implicit attitudes and cognitive business x explicit attitudes. In terms of the equation used for evaluating arguments, the only significant predictor was cognitive business $\beta=0.41$, $p<0.001$. Antismoking arguments were more persuasive when additional tasks absorbed the smokers’ cognitive resources ($M=1.68$ cm on scale where -9 cm meant “not convincing at all”, 9 cm “it’s fully convincing”), than in the not busy condition ($M=4.46$ cm).

Relationship between implicit attitudes and emotions

The next concept analyzed was the influence of implicit attitudes on emotions. Each subject’s ratings on the 8 emotions items were submitted to a principal-axis factor analysis with Varimax rotation (Eigen Values >1). A two factor solution accounted for 70% of the total variance. Factor 1 accounted for 52% of the variance and was identical to that of Study 1, because it included following items: guilt (0.88), sorrow (0.84), shame (0.75), fear (0.72), and anger (0.64). It was interpreted as a “conflict”. Factor 2, “aversion,” accounted for 18% of the variance and included three items: hostility (0.90), contempt (0.86), abomination (0.71).

Analogously, as seen in Study 1, the more negative implicit attitudes smokers had, the stronger conflict they experienced, $\beta=-0.22$, $p=0.04$. Additionally, the relationship was tested in two experimental conditions. When smokers were not cognitively busy, the more negative implicit attitudes they held, the stronger the conflict they experienced, $\beta=-0.34$, $p=0.028$. When cognitive resources were absorbed

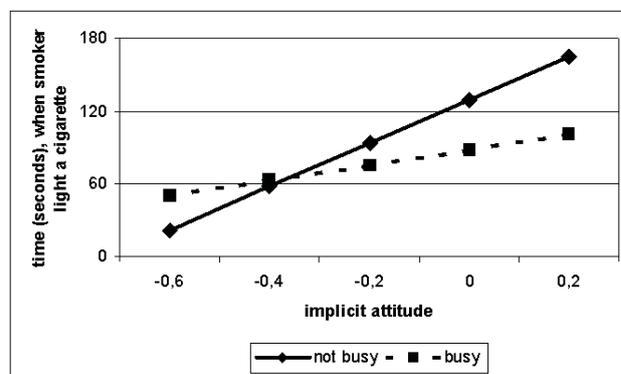


Figure 4. Time when smoker lights a cigarette as predicted by an interaction between implicit attitudes and cognitive capacity; OX – the smaller the value, the stronger the negative implicit attitudes held.

by an additional task, the relationship was insignificant as indicated by $\beta=-0.12$ and $p=0.44$. See Fig 3.

The significant predictor of experienced aversion (factor 2) was interaction between cognitive business and implicit attitudes, $\beta=-0.44$, $p<0.001$. When smokers had cognitive resources, the more negative implicit attitudes smokers held, the weaker the aversion they declared, $\beta=0.36$, $p=0.022$ (identical to that of Study 1). Without cognitive capacity, the more negative implicit attitudes held, the stronger the aversion they declared, $\beta=-0.52$, $p=0.001$.

Relationship between implicit attitudes and behavior

The influence of implicit attitudes, explicit attitudes, cognitive business and interaction between these variables on behavior was also tested. The only significant predictor was implicit attitudes, indicated by $\beta=0.35$ and $p=0.034$. The more negative attitudes smokers held, the sooner they lit a cigarette.

Additional analyses showed that the relationship was only significant when smokers were not busy, ($\beta=0.42$, $p=0.05$), but insignificant while they were busy ($\beta=0.03$, $p>0.1$).

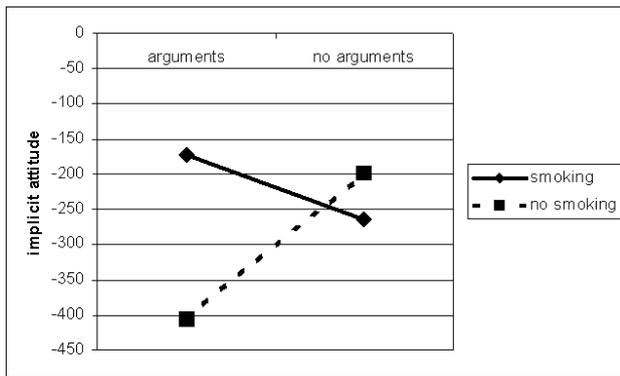


Figure 5. Implicit attitudes as a function of an interaction between smoking cigarettes and the presentation of antismoking arguments; OY – the smaller the value, the stronger the negative implicit attitudes held.

Discussion

Study 2 showed again that the more negative implicit attitudes smokers held, the stronger the conflict they experienced after watching antismoking arguments. As predicted, the relationship was only significant when smokers had cognitive resources to apply explicit attitudes. When they were cognitively busy, they could not apply explicit attitudes and thus no conflict was aroused.

Results fulfilled the prediction that overcompensation for implicit attitudes included not only experienced emotions but also behavior. When smokers had available cognitive resources to think about antismoking arguments, the more negative implicit attitudes they held, the weaker the aversion they declared and the sooner they lit a cigarette.

When the smokers' cognitive resources were absorbed by an additional task, there was a significant relationship realized between implicit attitudes and aversion (more negative implicit attitudes, stronger aversion). The insignificant relationship between implicit attitudes and time of lighting a cigarette was explained by the conclusion that smokers might control that behavior. After reflecting experienced emotions during evaluation of antismoking arguments, smokers had both the time and the possibility to think about them. When they entered the corridor, they were no longer cognitively busy, so they might control their behavior and apply explicit attitudes.

STUDY 3

Study 2 showed that the more negative implicit attitudes smokers held, the sooner it was that they lit a cigarette. It seemed that smokers smoked cigarettes to inhibit unwanted negative implicit attitudes. So, I predicted that smoking cigarettes inhibits negative implicit attitudes.

Method

Research participants and design

Fifty-two smokers participated in this research. Most of them (53%) were males and 47% were females with an average age of 22 years, $SD=2.1$. Participants smoked 11 cigarettes per day (on the average; $SD=9.2$) for approximately 5.3 years, $SD=3.9$.

Design 2x2: smokers were either presented or not presented with antismoking arguments; they either smoked cigarettes after presentation or did not.

The dependent measures were the implicit attitudes towards smoking.

Procedure and stimulus material

Smokers were recruited on the street. A female experimenter randomly assigned participants to one of the four treatment conditions: presentation of antismoking arguments vs. no presentation of antismoking arguments and smoking before attitude measure vs. no smoking before attitude measure. Following the trial task, participants were or were not presented with six antismoking arguments (the same as in Study 2). Then they either were asked to smoke (all participants agreed to do that) or did not smoke their own cigarettes. After that they performed the IAT (the same as in previous studies).

Results

First, there was the preparation of the IAT data (following Greenwald et al. 1998). Then, to test the effectiveness of experimental manipulation, the IAT data was analyzed using 2x2 between-subjects analysis of variance. Smokers' implicit attitudes were influenced by an interaction of the presentation of antismoking arguments and smoking, denoted by $F(1.48)=5.9$ and $p=0.019$, $\eta^2=.12$. See Fig 5.

Smokers had more positive implicit attitudes towards smoking after watching antismoking arguments and smoking cigarettes ($M=-172$ ms) than after only watching arguments ($M=-405$ ms), $F(1.22)=8.28$, $p=0.009$, $\eta^2=.23$.

Discussion

Study 3 confirmed that smoking cigarettes may inhibit negative implicit attitudes activated after watching antismoking arguments. The present study is the next one from a series of studies showing that implicit attitudes, measured by the IAT, can be changed in a laboratory (Blair, Ma, & Lenton, 2001; Dasgupta & Greenwald, 2001; Karpinski & Hilton, 2001; Kuhnen, Schiesl, Bauer, Paulig, Pohlman, & Schmidhals, 2001; Lowery, Hardin, & Sinclair, 2001; Rudman, Ashmore, & Gary, 2001). The new element

it brings on is the implication concerning the way in which implicit attitudes are influenced. The results from previous studies suggested that this influence originated from the activation of associations of an object, such as an African-American (Dasgupta & Greenwald, 2001) with a desired evaluation of the object (attractive). The interesting result of the present study was that both the process of activation and the inhibition of implicit attitudes were observed. Activation of implicit attitudes resulted when smokers were presented with antismoking arguments. On the other hand, when they smoked a cigarette after the presentation of the arguments, negative implicit attitudes were inhibited (a kind of deactivation).

General Discussion

Implicit attitudes as a predictor of behavior

Results confirmed that implicit attitudes might be in some circumstances a better predictor of emotions and behavior than explicit attitudes. They showed that a comprehensive model of the relationship between implicit attitudes and behavior must account for: 1) conditions of implicit attitudes applications (cognitive business) and 2) the relationship between implicit and explicit attitudes (consistent or inconsistent).

According to Model of Dual Attitudes proposed by Wilson et al. (2000), when smokers were cognitively busy, only implicit attitudes influenced experienced emotions. Under these circumstances, there was an assimilation effect: smokers tended to declare a stronger aversion in keeping with the strength of their negative implicit attitudes.

Opposite results were observed under the cognitive capacity condition. Because it allowed for simultaneous application of explicit and implicit attitudes, there was an important relationship between them. A smoker's negative implicit attitudes, activated by anti-smoking arguments (smoking=death), inconsistent with their positive explicit attitudes (I like smoking), were experienced as a conflict (guilt, shame). The more negative the implicit attitudes smokers held, the stronger the conflict they declared. To avoid such a conflict they inhibited negative implicit attitudes. Smoking cigarettes served as the means to achieve this. Therefore, the more negative implicit attitudes they held, the weaker the aversion they declared and the sooner they lit a cigarette (a contrast effect).

Non-smokers had both negative implicit and explicit attitudes (consistent), so there was no relationship between implicit attitudes and conflict. They tended to declare a stronger aversion in keeping with the strength of their negative implicit attitudes.

How smokers knew that their "implicit" attitudes were activated

If there was a relationship between implicit attitudes and conflict experienced after watching anti-smoking arguments, did it mean that smokers were aware of their implicit attitudes? According to Greenwald and Banaji's (1995) definition, people seem to be unaware of implicit attitudes (i.e. prejudice – people are unaware of negative evaluation of an out-group). Wilson et al. (2000) assumed that people are often aware, at least fleetingly, of their implicit attitudes. It seems that at least one more explanation to the question of whether or not people are aware of implicit attitudes is possible. The distinction between two phases of attitude, activation and application, can be helpful in understanding this issue (Bargh, 1999; Blair & Banaji, 1996; Devine, 1989; Gilbert & Hixon, 1991; Kunda & Spencer, 2003). People seem to be unaware of their implicit attitude's activation (e.g. Fazio, Sanbonmatsu, Powell, & Kardes, 1986), but might be aware of their application of it. Results suggested that smokers were unaware of their own implicit attitudes, but they were aware of unpleasant thoughts and negative emotions accompanying them ("I feel distaste"). When they were aware of those thoughts and emotions (in cognitive capacity condition), there was a noticeable relationship between implicit attitudes and experienced conflict (I like to smoke cigarettes although "I feel distaste"). When an additional task was presented, it became more difficult to realize those thoughts and emotions, and there was no significant relationship.

The dynamics of the relationship between implicit and explicit attitudes

The differentiation between attitude activation and attitude application indicates one more important aspect between implicit and explicit attitudes: dynamics over time. The first few seconds of a response can be controlled by implicit attitude. It is activated automatically, in just milliseconds, without a subject's effort. However, for application of explicit attitude, some time is needed. Explicit attitude takes over its role in regulation after only a few seconds. Then the behavior of a person would result from inhibition of unwanted negative implicit attitude.

To better illustrate these assumptions, let's imagine that a smoker is watching an antismoking PSA. This is the way that the person's implicit attitude is activated, and this attitude affects the response within the first few seconds (e.g. The smoker who has a strong negative implicit attitude feels aversion towards smoking). However, after a few seconds the person will be able to apply his/her explicit attitude. Only then will he or she discredit the antismoking arguments according to his or her positive explicit attitude. This will be subsequently followed by the smoker taking a cigarette in order to inhibit the negative implicit attitude.

Why do people inhibit implicit attitudes?

According to the Unified Theory of Implicit Social Cognition (Greenwald et al., 2002), people avoid inconsistency between evaluations: “I like smoking” and “smoking kills me.” To obtain consistency they must inhibit one of those evaluations.

Smokers might inhibit their negative implicit attitudes, instead of their explicit ones, because explicit attitudes might be rooted in addictive behavior. Nicotine, extracted from cigarette smoke, not only has rewarding and stimulant effects (Murray, 1991), but it is also addictive. Giving up smoking is accompanied by nicotinic hunger, bad mood, low blood pressure, and irritation (Harrison, Liem, & Markou, 2001). It is hard to change addictive behavior, so smokers inhibit negative implicit attitudes instead of explicit ones.

An inhibition of implicit attitudes may depend on development of internal standards to control them (Plant & Devine, 1998). Goals can serve as such standards and allow for preconscious control of automatic evaluations (Moskowitz, Gollwitzer, Wasel, & Schaal, 1999). The process of development of those standards involves not only successes but also failures in control that evokes such emotions as guilt and shame. Studies on inhibition of implicit attitudes provide an alternative interpretation of obtained results. According to them, guilt, shame was not caused by inconsistency of attitudes, but conflict between addiction (I smoke) and threat caused by antismoking arguments (smoking=cancer). Those smokers that had stronger negative implicit attitudes experience stronger conflict, because they were less successful in inhibition of threatening negative associations.

How do implicit attitudes come into existence?

The results of the present study can serve as a means to better understand how implicit attitudes come into existence. Wilson, Lindsay, and Schooler (2000) assumed that the previous explicit attitude is the source of implicit attitude. Thus, when a person smokes a cigarette and has positive explicit attitudes towards smoking, after changing this attitude into negative one (after quitting smoking), the previous positive explicit attitude should be a source of positive implicit attitude. In the present study, that assumption could be verified because in Experiment 1, 10 people who did not smoke at the time of the study (had quit smoking) participated. It turned out that their implicit attitudes (-516 Ms) did not differ significantly from those of people who had never smoked (-582 Ms). Therefore, it seems that the previous explicit attitude is not a source of the implicit one. It was important to comprehend how implicit attitudes are formed. Thinking about the differences in the strength of implicit attitudes of nonsmokers (-582 Ms), those who smoke occasionally (-486 Ms) and those who smoke regularly (-361 Ms) was helpful. The more a person was addicted to smoking, the more positive attitudes were

(however the correlation between the number of cigarettes smoked and the strength of negative implicit attitude was low: $r=0.25$, $p<0.01$). Thus, it seems that implicit attitudes are simply a result of associations with smoking. Smokers' attitudes are more positive than non-smokers because smokers have more positive experiences with smoking.

“Central attack” or “Trojan horse”?

The research has not only theoretical, but also practical implications. Persuasive messages, which make smokers think about antismoking arguments, might bring counter effects. Smokers might try to overcompensate (inhibit) for implicit attitudes, so they may in turn smoke more cigarettes. More beneficial than a “central attack” would be to implement the strategy of the “Trojan horse”. According to this strategy, persuasive messages should activate implicit attitudes, but not to motivate people to think about behavior.

Did explicit attitudes lose their validity?

The title of this section connects to Bargh's question (1997): “Did explicit attitudes lose their validity?”. Bargh put this question forward at the end of his article in which he questioned the main role of consciousness in behavior regulation. He reasoned that the phenomena studied by social psychologists are automatic by nature. Nonetheless, answering the question he stressed that consciousness is not an epiphenomenon and it has an important role to play in connecting automatic processes to the external world.

In the case of explicit attitudes, things can be analogous. In the present study more behavior was predicted by implicit attitude. It is worth mentioning that smokers smoke cigarettes in accordance with their positive explicit attitude but not in accordance with their negative implicit attitude. The explicit attitude most likely plays the role of a “political censor” who flexibly controls the unwanted – according to his perspective – influence of implicit attitude on behavior. The tendentious declarations of positive attitudes towards smoking serve this purpose (e.g. The stronger the negative implicit attitude a smoker held, the weaker the aversion he or she declared). It seems then that the explicit attitude neither lost its validity, nor has a prevailing role but interacts as a “censor” with implicit attitude – “underground” (where undesired experiences are stored) – in the course of behavior regulation.

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