This is an Accepted Manuscript of an article published by Routledge in the journal *Psyecology*, issue 6(1), 2015, pp. 35–72; published online 10 Mar 2015. Available online: http://dx.doi.org/10.1080/21711976.2014.1002204

Attentional Focus and Anticipated Emotions in the Face of Future Environmental Risks: Should I take the Train or Drive my Car?

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Author Note

This research was supported by the German Research Council (grant BO 1480/1-3 to the first author). We wish to thank Stefanie Rhein, Sonja Schlegel, Anja Vocilka, Susanne Jaggy, and Petra Baisch for their support in conducting the experiment. Address correspondence to Gisela Böhm, University of Bergen, Department of Psychosocial Science, Christiesgate 12, 5015 Bergen, Norway, gisela.boehm@psysp.uib.no.

Abstract

This study presents an experiment investigating the effects of attentional focus and valence of experience on anticipated emotions and on intentions to drive by car or to use public transportation. Car driving is associated with being detrimental for the environment, whereas using public transportation is assumed to be environmentally beneficial. We regard environmentally friendly behavior as an instantiation of a problem-focused coping strategy that is triggered by anticipated threat from an environmental stressor and aims at reducing the environmental problem. A discrepancy, however, may exist between the immediate experience of driving a car or using public transport, and the long-term experience of the consequences, that is, a polluted versus a healthy environment. Employing multimedia scenarios, we manipulated participants' attention to focus either on behavior (car or public transport) or on the environmental consequences, and induced either a positively or a negatively valenced experience. We measured anticipated emotions and intentions to use the car or public transport, and repeated the measurements two weeks later. Most important, a focus on consequences turns out to have stronger effects on emotions than a focus on behavior. Also, intentions to use a car or public transport change when focusing on the future consequences, but not when focusing on the positive or negative circumstances accompanying the behaviors. A mediation analysis shows that while focusing on the consequences influences both anticipated emotions and behavioral intentions, the effect of focus on behavioral intentions is not mediated by anticipated emotions. Results suggest that emphasizing the long-term consequences of one's behavior is a better means of fostering pro-environmental behavior than emphasizing the experience of the behaviors per se.

Keywords: Attentional focus, anticipated emotions, environmental risk, environmental behavior, car driving

Attentional Focus and Anticipated Emotions in the Face of Future Environmental Risks: Should I take the Train or Drive my Car?

Environmental problems such as climate change or instances of environmental pollution or destruction can act as stressors and lead to perceived threat (Homburg & Stolberg, 2006). Pro-environmental behavior may then be motivated by the desire to avert such environmental problems or their negative consequences and may be seen as an attempt to cope with the environmental stressor. Since pro-environmental behavior aims at reducing the environmental problem, it can be interpreted as an instance of a problem-focused and primary control coping strategy, that is, a strategy that focuses on solving the problem and changing the external world rather than focusing on emotions and changing the self (Skinner, Edge, Altman, & Sherwood, 2003). Homburg and colleagues (Homburg & Stolberg, 2006; Homburg, Stolberg, & Wagner, 2007) could show that environmental problems trigger stress reactions and that pro-environmental behavior is fostered if people respond with problem-focused coping strategies. In contrast, non-problem focused strategies (e.g., attempts to downplay the problem or deny responsibility) are not or negatively related to pro-environmental behavior.

In many life domains coping refers to a response to events that have happened in the past, such as a loss, illness or victimization. In the environmental domain, in contrast, pro-environmental behavior usually aims to prevent future negative consequences of environmental problems, for example when people try to mitigate climate change or, more generally, try to preserve the environment for future generations (Böhm & Pfister, 2000; Böhm & Tanner, 2013). Everyday pro-environmental behavior such as recycling or energy saving is a reaction to anticipated threat, although the anticipation is probably in part based on past experiences with similar events (Böhm & Pfister, 2008a).

Just as in any decision situation, when making a choice between a pro-environmental option and an environmentally harmful alternative, the decision maker's task is to anticipate the consequences of each decision option as well as his or her reactions to these consequences. An influential factor in shaping behavior is which emotions people anticipate to experience at a future point in time when they implement a decision or experience the consequences of a decision; a process that has been termed anticipated emotions, affective forecasting, or prospection (Gilbert & Wilson, 2007; Loewenstein & Lerner, 2003).

In the health domain, it has been shown that it makes a difference whether people anticipate their emotions in the short term with respect to implementing a choice, that is, performing a behavior, or in the long term with respect to experiencing the consequences of the behavior. This was demonstrated by Richard, van der Pligt, and de Vries (1996) in their seminal study on sexual risk taking behavior. They induced one group of participants to anticipate the feelings that they would experience *after* having had unprotected sex, another group was led to focus on their feelings *about* having unprotected sex. The group that focused on the post-behavioral emotions (a) reported more negative feelings, (b) expressed a stronger expectation to reduce their risk in future interactions by using a condom, and (c) reported safer sexual practices in a follow-up five months later. Anticipated regret specifically has been shown to be a powerful means to reduce health risk behavior and to promote precautionary health behavior (van der Pligt, 2002).

Health behaviors often exhibit a typical hedonic structure such that unhealthy behaviors are themselves pleasurable – which is why people perform them – but the long-term negative consequences can be devastating and arouse intense negative emotions. If such a hedonic discrepancy exists between a behavior and its consequences, the decision may depend on the

time perspective, that is, whether the decision maker focuses on the behavior or on its consequences when making the decision.

Environmental behavior and health behavior have many similarities; the hedonic discrepancy between behavior and its consequences is one of them. Often, environmentally harmful behavioral alternatives are themselves pleasant, comfortable, and convenient, which contrasts with their negative environmental impact. Conversely, pro-environmental behaviors are commonly slightly more inconvenient and arduous than their environmentally harmful alternatives, so that an unpleasant experience while performing the behavior must be traded-off with the behavior's positive environmental consequences. As an example, think of the decision whether to use one's own car for a particular trip or not. The car provides a high level of convenience and comfort; the ride itself may thus be anticipated to be pleasant and enjoyable. Anticipating the negative environmental consequences of car usage, in contrast, may be associated with negative emotions such as guilt and regret concerning having contributed to pollution, resource depletion, and climate change. The alternatives to using a car, for example biking or using public transport, are all more effortful than taking the car. With respect to public transport the decision maker may then anticipate an inconvenient ride on a crowded bus when focusing on the behavior, which contrasts with anticipating a clean and pleasant future environment that results from using public transport when focusing on the consequences.

The aim of the present study is to investigate whether environmental behavior is guided by anticipated emotions in a similar manner as it has been shown for health risk behaviors. More specifically, we want to find out whether environmentally harmful behavior can be reduced or pro-environmental behavior be fostered by focusing people's attention on the environmental consequences of their behaviors and on the emotions that they anticipate to experience as

reactions to these consequences, compared to focusing their attention on the anticipated emotions that are associated with the behavior. Adopting more pro-environmental or lesser environmentally harmful behaviors can thus be regarded as an expression of a problem-focused coping strategy that aims at reducing an environmental problem and the threat emanating from it.

Following the design of Richard and colleagues (1996), car driving was chosen as the environmentally harmful target behavior. As the pro-environmental alternative, we chose public transport, because we assumed that for routes that people drive by car public transport would be the most relevant alternative for most people in most situations. Note that it is not necessary that a car ride is always pleasant and a trip by public transport always unpleasant. A car ride can also be strenuous and tiresome rather than joyful; likewise, a train ride can be comfortable and relaxing rather than uncomfortable and effortful. Therefore, we manipulated the focus of attention (on behavior itself while driving one's car, on behavior itself while riding by train, or on future environmental consequences) as well as the valence of the experience (positive or negative). This resulted in six between-subject conditions in which participants were induced to anticipate a) a pleasant car ride, b) an unpleasant car ride, c) a pleasant trip by public transport, d) an unpleasant trip by public transport, e) a pleasant clean future environment due to a general reduction of car traffic, or f) an unpleasant future environment that is polluted from too much car traffic. We measured anticipated emotions, self-reported car utilization, and behavioral intentions with respect to future transport mode choice. The same variables were measured at a follow-up two weeks later.

Irrespective of the transportation mode, we expect that the positive valence conditions trigger more intense positive and less intense negative anticipated emotions than their negative valence counterparts.

Concerning the car driving conditions, we expected that anticipating the negative future consequences of car traffic would induce more intense negative and less intense positive emotions than anticipating a pleasant car ride. Correspondingly, intentions to use the car should be lower when the negative future conditions are anticipated compared to anticipating a pleasant car ride. These two conditions correspond to the hedonic discrepancy of a pleasurable behavior that leads to regrettable consequences (Richard et al., 1996). Anticipating an unpleasant car ride is expected to have a similar effect, compared to anticipating a pleasant car ride, as anticipating the negative future consequences of car driving. Again, anticipated negative emotions (e.g., anger about a traffic jam) are expected to be more intense, positive anticipated emotions less intense, and car utilization as well as car use intentions are expected to be lower than in the pleasant car ride condition.

Our predictions for the public transport conditions mirror those for the car driving conditions. When participants focus on the positive environmental consequences of public transport and the resulting pleasant future, we expect that anticipated positive emotions are more intense, anticipated negative emotions less intense, and intentions to use public transport stronger than when focusing on an unpleasant trip by public transport. The effect of anticipating a pleasant trip by public transport, compared to anticipating an unpleasant trip, are expected to be similar, if not of the same size, as the effect of anticipating the positive consequences.

Method

Participants

Two hundred and thirty-nine undergraduate and graduate students at the University of Education Ludwigsburg (Germany) participated in the study. All majored in education or pedagogics. They

received a monetary incentive of € 11.00 for their participation. Their age ranged from 19 to 39 years (M = 22.46, SD = 3.41); 81.6 % were female, which corresponds to the gender distribution at the university.

Design and Procedure

Two transportation options were selected: driving by car as the presumed environmentally harmful option, and taking the train, that is, public transport, as the presumed pro-environmental option. Two independent variables were manipulated, focus of attention and valence of experience. Focus of attention was varied in three levels: car driving behavior, public transportation behavior, and environmental consequences; valence of experience was varied on two levels as being either positive or negative, resulting in six between-subjects conditions.

The experimental manipulation was implemented by presenting to participants different versions of a slide show, which described a scenario that portrayed a protagonist who traveled to work either by car (behavior-car condition), or by train (behavior-public transport condition), or who experienced a projected future in approximately 20 years, emphasizing environmental consequences (consequences condition). The experience of the ride to work or of the future consequences was portrayed as being either highly pleasant (positive valence condition) or highly unpleasant (negative valence condition). Each slide show consisted of a sequence of images with accompanying textual comment; the duration of a slide show was three minutes. For each scenario a version with a male and a version with a female protagonist was constructed, and the presented scenario matched the participant's gender. The scenarios used in the six conditions are briefly summarized in Table 1.

Participants were randomly assigned to conditions; they are approximately equally distributed across conditions, cell frequencies range from 37 to 42.

The experiment consisted of two sessions. Session 1 was run in groups of six to eight participants. All participants in one group were of the same sex and were presented with a scenario that depicted a protagonist that was of their own sex. Session 1 started with a questionnaire that measured participants' rank ordering of various travel modes and their car utilization. Then the experimental manipulation was implemented by presenting the slide show. After the slide show, a questionnaire was distributed measuring anticipated emotions and behavioral intentions concerning future travel mode choice. Session 1 lasted approximately 30 minutes.

Session 2 was a follow-up that took place two weeks after Session 1. In Session 2, participants showed up individually and filled in a questionnaire that measured anticipated emotions, car utilization, and behavioral intentions concerning future travel mode choice. These measures were identical to the ones used in Session 1. Session 2 lasted approximately 15 minutes. At the end of Session 2 participants were debriefed, thanked, and received their monetary incentive.

Measures

In the following, we will denote the first part of Session 1 that took place immediately before the experimental manipulation as t0, the second part of Session 1 after the manipulation as t1, and Session 2 as t2. The following dependent variables were measured:

Rank ordering of transportation modes. As a base line measure and control variable we asked participants to select from the following set of transportation modes the one that they

use most frequently (Rank 1), the second most frequent (Rank 2), and the third most frequent mode (Rank 3): (a) bike, (b) walking, (c) car, (d) public transport (e.g., tram, bus, train), (e) motorcycle, (f) motorized bike, and (g) combination (e.g., park and ride). Transportation modes that were not ranked among the first three received a code of 4.

Frequency of car use. From the rank ordering of transportation modes we constructed a control variable for frequency of car use. Those who placed the car on first rank were assigned a value of 4, on second rank a 3, on third rank a 2, and those who did not rank car among the first three were assigned a 1. Thus, higher scores on the variable frequency of car use correspond to more frequent use of car.

Car Utilisation Scale. Eleven items were presented that were intended to measure how participants utilized a car, specifically, whether participants dealt with the car in a pro-environmental way. The items were selected and adapted from Schahn, Damian, Schurig, and Füchsle (2000). Each item asked for agreement on a four-point scale ranging from 1 (*not at all*) to 4 (*completely*). The eleven items were: (i) In the winter I often let my car run idle to warm up (reverse coded), (ii) The roof rack of my car is permanently mounted (reverse coded), (iii) I have departure schedules for buses or trains that depart from my home or my place of work at hand, (iv) I undertake excursions into the countryside by car (reverse coded), (v) I am very careful to organize my car trips so that few single trips are necessary, (vi) For longer waiting times (e.g., traffic lights / railway crossings), I always turn off the engine of my car, (vii) I always car pool, (viii) I know specific departure times for buses or trains that depart from my home or my place of work, (ix) For short distances (up to 2km) I always do without my car, (x) The trunk of my car is always fully packed (reverse coded), (xi) I am very careful, only then to use a car when there is no alternative to it.

These items were measured at t0 and t2. Item (ii) turned out to yield no variance, presumably because participants did not have a roof rack; it was omitted from further analyses.

Exploratory factor analyses of the remaining ten items indicated that they did not form a unidimensional scale. At both points in time, t0 and t1, the items yielded a two-factor structure (maximum-likelihood FA with varimax rotation), accounting for 32% (t0) and 33% (t2) of variance, respectively. Factor 1 represents environmentally friendly utilization of one's car [items (i), (iv) to (vii), (ix) to (xi), e.g., "For short distances I always do without my car."]. Factor 2 represents familiarity with bus and train schedules [items (iii) and (viii), e.g., "I know specific departure times for buses or trains ..."]. As our intention was to measure car utilization, we used only the items loading on Factor 1 to construct a *Car Utilization Scale* from the estimated factor scores; the two items loading on Factor 2 were not used in further analyses. Cronbach's alpha of the Car Utilization Scale was .64 at t0 and .65 at t2. High scores on this scale indicate an environmentally friendly style of car utilization.

Note that even though the items of this scale were adapted from an existing scale, the exact collection and phrasing of these items are new and form an ad hoc scale the validity of which is untested. However, we are not aware of any established instruments measuring specifically the utilization of cars with respect to environmental friendliness.

Anticipated emotions. Anticipated emotions were measured on ad hoc rating scales like the ones commonly used in research on affective forecasting (cf., e.g., Gilbert & Wilson, 2007). Participants were instructed to anticipate their emotions with respect to different events depending on their focus condition. Participants in the behavior–car condition were instructed to think of a particular route that they normally drive by car, for example their way to work, and to imagine in as detailed a way as possible the next time they would drive this route by car and how

they would experience this next car ride. For participants in the behavior–public transport condition the instructions were the same except that they were asked to think of a route that they would take by public transport. Participants in the consequences condition were instructed to imagine what the future would be like with respect to traffic, air quality, environment, and climate, and how they would experience this future. All participants were asked which emotions the anticipated event evoked in them.

Participants gave two ratings, one for the intensity with which they anticipated *positive emotions* and one for the intensity of *negative emotions*.[1] Both ratings were given on a seven-point rating scale ranging from 1 (*not at all*) to 7 (*very strongly*). Anticipated emotions were measured at t1 and at t2. At both points in time each participant anticipated emotions with respect to the event that corresponded to his or her experimental condition (behavior-car, behavior-public transport or consequences). Anticipated emotions also served as a manipulation check for the valence manipulation.

Behavioral intention concerning travel mode choice. Behavioral intentions were measured on ad hoc rating scales. We asked participants "Do you intend to use the following means of transport in the near future more or less often than before?". This question was asked for *car* and for *public transport*. The response scale ranged from -3 (*definitely less often*) via 0 (*equally often as before*) to +3 (*definitely more often*).

Results

We will structure the results section according to the dependent variables. Each dependent variable was analyzed by means of a 3 (focus: behavior-car vs. behavior-public transport vs. consequences) × 2 (valence: positive vs. negative) × 2 (time: t0 vs. t2 or t1 vs. t2)

analysis of variance with repeated measures across time. Anticipated emotions and behavioral intentions were measured at t1 and t2 so that these are the two levels of the repeated measures factor Time for these dependent variables. The Car Utilization Scale score was measured at t0 and t2 so that for this dependent variable these two points of measurement form the levels of the factor Time. All analyses were conducted with the mixed-effects function lmer (Bates et al., 2014) as part of the R statistical software (R Core Team, 2013), using the Kenward-Roger approximation for degrees of freedom (Kenward & Roger, 1997) due to unequal cell sizes, and the multiple comparison procedures from Hothorn, Bretz, and Westfall (2008) for post hoc contrasts. All analyses were conducted with and without frequency of car use as a control variable. Including this control variable did not alter any of the results; we therefore report the analyses without it.

Rank ordering of transportation modes

Participants ranked the transportation modes in the following order according to their frequency of using them (mean rank in parentheses): car ($M = 2.10$), public transport ($M = 2.11$), walking ($M = 2.85$), bike ($M = 3.38$), combination ($M = 3.77$), motorized bike ($M = 3.95$), and motorcycle ($M = 3.97$). The rank order indicated that the two transportation modes that we selected were indeed the most important ones for our participants and that they were about equally important. Walking was the third most important mode of transportation; all others were of minor importance (remember that rank could range from 1 to 4).

Anticipated Emotions

Intensity of anticipated positive emotions. The analysis of anticipated positive emotions yielded significant main effects for focus and valence as well as significant two-way interactions for Focus × Valence and Valence × Time.

Participants in the positive valence condition (M = 4.08, SD = 1.49) anticipated more intense positive emotions than participants in the negative valence condition (M = 3.35, SD = 1.51), F(1, 230.62) = 33.81, $p < .001$, $\eta^2_p = .09$. This effect primarily demonstrates that the valence manipulation was successful.

According to the main effect for focus, $F(2, 230.53) = 68.62$, $p < .001$, $\eta^2_p = .30$, participants in the behavior-car condition (M = 4.7, SD = 1.18) anticipated more positive emotions for their next car ride than behavior-public transport participants did for their next trip by public transport (M = 3.61, SD = 1.3), post hoc contrast $z = -5.10$, $p < .001$. Both behavior conditions elicited more intense anticipated positive emotions when contrasted with the consequences condition (M = 2.72, SD = 1.48), $z = 8.26$, $p < .001$ (see Fig. 1). Thus, car is generally associated with more positive anticipated emotions than public transport. Thinking about the future elicits the least positive anticipated emotions.

The interaction between focus and valence is depicted in Figure 1, $F(2, 230.53) = 3.87$, $p = .022$, $\eta^2_p = .02$. The valence conditions differ only in the behavior–public transport ($z = -3.58$, $p = .005$) and the consequences conditions ($z = -5.02$, $p < .001$), but not in the behavior–car condition. Apparently, car driving is associated with positive emotions, which is not affected by drawing attention to the unpleasant aspects of it.

The interaction between time and valence is depicted in Figure 2, $F(1, 221.74) = 11.53$, $p < .001$, $\eta^2_p = .01$. Whereas the valence conditions differ clearly at t1 ($z = -5.25$, $p < .001$), this difference is attenuated at t2, though still significant ($z = -2.58$, $p = .044$). Thus, while the effect of the valence manipulation on positive anticipated emotions weakened over time it still persisted after a period of two weeks.

Intensity of anticipated negative emotions. The results for anticipated negative emotions as the dependent variable largely mirror those for anticipated positive emotions. The analysis of variance yielded main effects for focus, $F(2, 232.23) = 86.04$, $p < .001$, $\eta^2_p = .35$, valence, $F(1, 232.23) = 18.43$, $p < .001$, $\eta^2_p = .05$, and time, $F(1, 224.78) = 8.84$, $p = .003$, $\eta^2_p = .009$, as well as a significant interaction between valence and time, $F(1, 224.78) = 16.49$, $p < .001$, $\eta^2_p = .02$.

The main effects for focus and valence are shown in Figure 3. The negative valence condition ($M = 4.23$, $SD = 1.73$) aroused more intense anticipated negative emotions than the positive valence condition ($M = 3.65$, $SD = 1.65$), again confirming that the valence manipulation was successful.

With respect to the main effect of focus, the behavior-car condition ($M = 2.8$, $SD = 1.22$) elicited less negative anticipated emotions than the behavior-public transport condition ($M = 3.86$, $SD = 1.5$) according to a post hoc contrast, $z = 5.00$, $p < .001$; also, both behavior conditions were lower in anticipated negative emotions than the consequences condition ($M = 5.23$, $SD = 1.49$), $z = -10.43$, $p < .001$. Thus, as for positive anticipated emotions, we see that public transport is generally associated with more negative emotions than car driving and that thinking of the future elicits the most negative anticipated emotions. The latter shows the high potential for inducing anticipated regret by drawing attention to the negative future consequences of car driving. Interestingly, pointing out how positive the future could be if car driving were reduced has a similar effect in triggering negative anticipated emotions.

As can be seen in Figure 4, which shows the Time × Valence interaction, the difference between the negative and positive valence conditions is pronounced and significant at t1 ($z =$

4.57, $p < .001$), but the difference disappears at t2; specifically, the effect of the negative valence manipulation wears off from t1 to t2 ($z = -5.21$, $p < .001$).

Behavioral Intentions

Intention to use the car in the future. With the intention to use a car in the future as the dependent variable, an analysis of variance yielded a main effect of focus, $F(2, 232.63) = 5.98$, $p = .003$, $\eta^2_p = .05$, and a significant interaction between focus and time, $F(2, 226.79) = 3.90$, $p = .022$, $\eta^2_p < .008$. As depicted in Figure 5, at t1 participants in the consequences condition ($M = -0.58$, $SD = 0.88$) intended to reduce their car driving more than participants in the behavior conditions (behavior–car: $M = -0.15$, $SD = 0.86$; behavior–public transport: $M = -0.24$, $SD = 0.87$), $z = 3.10$, $p = .004$; the difference between the two behavior conditions is not significant. Note that this effect corresponds to the main effect for focus that was found for both positive and negative anticipated emotions. The consequences condition is the one in which participants anticipated the most negative and the least positive emotions – and it is also the one where they want to reduce their car driving the most.

According to the Focus × Time interaction, the intention to use a car decreases in the behavior-car condition from t1 to t2 ($z = 2.39$, $p = .047$); though the difference is small it may suggest that changing one's intention does not occur immediately but takes some time. However, intentions at t1 do not differ from those at t2 in the other two focus conditions (see Fig. 5).

Intention to use public transport in the future. The intention to increase the use of public transport in the future yields a main effect only for the focus manipulation, $F(2, 232.32) = 5.87$, $p = .003$, $\eta^2_p = .03$. It is stronger in the consequences condition ($M = 0.51$, $SD = 0.86$) than in the behavior conditions (behavior–car: $M = 0.18$, $SD = 0.81$, behavior–public transport: $M = 0.23$, $SD = 0.74$). Post hoc comparisons show no significant difference between any of the

conditions, though; thus, this effect should be interpreted with caution. The pattern, however, is the same as we found it for car use intention and corresponds to the focus main effect for emotions: Participants in the consequences condition experience more negative and less positive emotions and intend to reduce car driving as well as increase use of public transport, compared to the behavior conditions.

Car Utilisation Scale

As measured by the Car Utilization Scale, participants utilized their car in a slightly more environmentally friendly manner at t2 ($M = 2.87$, $SD = 0.39$) than at t0 ($M = 2.82$, $SD = 0.40$), $F(1, 233) = 8.31$, $p = .004$, $\eta^2_p = .003$; no further effects on car utilization were identified.

Mediation Analyses

Our basic hypothesis assumes that future environmental risks trigger anticipated emotions (e.g., anticipated regret) and that these emotions then promote pro-environmental behaviors as a strategy to cope with the problem. Thus, anticipated emotions are assumed to mediate between the perception of an environmental risk and environmental behavior. In the context of the current study this means that the experimental treatment shapes anticipated emotions, which then in turn direct environmental behavior. To test this assumption, we conducted a mediation analysis. The most concise approach to testing a mediation assumption would be to follow a structural equation modeling (SEM) approach. Our limited sample size precluded a SEM analysis, though. We therefore followed the traditional mediation analysis approach proposed by Baron and Kenny (1986). Our full 3 × 2 experimental design is too complex for this approach; we therefore simplified the design based on the results of the preceding analyses of variance. We found that while the valence manipulation did affect anticipated emotions, the effect of the focus manipulation was generally stronger. The focus effect was such that the consequences condition

differed from the behavior conditions (car, public transport), which did not differ themselves. Therefore, we considered only focus as the independent variable in the mediation model and dichotomized it into behavior condition versus consequences condition (coded as 0 and 1, respectively). Employing this dichotomous focus variable we tested the assumption that the effect of focus on behavioral intention (dependent variable) is mediated by anticipated emotions (mediating variable). We tested this mediation assumption for t1 and t2, using both positive and negative emotions as mediator and intention to use the car in the future as well as intention to use public transport in the future as the dependent variable. This results in eight mediation analyses, which are presented in Table 2. The results are consistent across analyses (although effects are generally weaker at t2): Focus strongly predicts anticipated emotions such that the consequences condition elicits more negative and less positive emotions. Focus also strongly predicts behavioral intentions such that the intention to use the car is reduced and the intention to use public transport is increased in the consequences condition compared to the behavior condition. However, when both focus and anticipated emotions are entered as predictors in the regression model then only focus remains significant. In sum, while both anticipated emotions and behavioral intentions are affected by focus, we find no evidence for the assumption that the relationship between focus and intentions is mediated by emotions.

Discussion

We will first summarize the results. The anticipated emotions indicate that the valence of experience was manipulated successfully. Participants in the positive valence condition anticipated more intense positive and less intense negative emotions than participants in the negative valence condition. Anticipated emotions are also affected by the focus of attention. The

consequence condition is experienced more negatively, that is, more intense negative and less intense positive emotions are anticipated, than in the two behavior focus conditions. Of those, a car ride is generally anticipated to be more positive and less negative than a ride by public transport. Even though the effect of the valence manipulation on anticipated emotions generally diminishes over time, positive anticipated emotions are still more intense in the positive than in the negative condition after two weeks. The induced negative anticipated emotions, in contrast, vanish completely over time so that after two weeks the negative condition reaches the level of the positive condition with respect to the intensity of anticipated negative emotions.

While the valence manipulation did induce anticipated emotions, this effect was not transferred to behavioral intentions. Both intention to use the car in the future and intention to use public transport in the future were affected by the focus of attention, but not by the valence of the experience. Particularly the consequence condition differs from the two behavior focus conditions. The intention to reduce car driving as well as the intention to increase the use of public transport is stronger in the consequence condition than in the two behavior focus conditions, which do not differ among each other. Note that in the negative consequence condition a dire future environment was described that resulted from too much car traffic, and in the positive environment condition a clean and healthy future environment was described that resulted from a drastic reduction in car use. Thus, both scenarios call for a reduction in car driving. Apparently, directing the attention to future consequences influences intentions more strongly than a luring or deterring description of the behavior.

Concerning the intention to reduce car driving, focus of attention interacted with time of measurement. The effect of focusing on future consequences was unchanged after two weeks; focusing on a car ride in the behavior-car condition seems to have had a delayed effect on

intentions in that participants in this condition intended to reduce their car driving at t2 but not at t1. Similarly, general car use behavior as measured by the Car Utilization Scale was slightly more environmentally friendly at t2 than at t1.

Imagining the future and its affective impact may influence our current decisions (Gilbert & Wilson, 2007). Common knowledge implies that car driving will deteriorate the global environment in the long run, whereas using public transport will be beneficial for the environment. Our findings suggest that directing attentional focus on these future consequences in fact influences one's anticipated emotions and intentions to use car or public transport. The effects identified in this experiment were fairly small, but so was the experimental treatment consisting of only a three-minute slide show. Interestingly, a focus on the negative consequences of car driving or on the positive consequences of public transportation have converging effects: In both cases positive emotions decrease, negative emotions increase, the intention to use one's car is reduced and the intention to use public transport is increased. Apparently, less car use and more use of public transport are both considered means of avoiding negative as well as of obtaining positive environmental consequences.

We could identify a similar effect for environmental behavior as it has been documented for health behavior: When people focus on the longer term consequences of their environmental behavior, rather than on the shorter term aspects of the behavior itself, they anticipate negative emotional states; presumably threat and regret are important components of these anticipated emotions. We could also show that focusing on the consequences instead of on the behavior moves behavioral intentions toward a more pro-environmental and less environmentally harmful direction. These results are in line with Joireman, van Lange and van Vugt's (2004) findings, showing that it is mainly people's future orientation that shapes their commuting preferences.

Hence, on the affective and on the behavioral level we see that environmentally harmful consequences induce threat and coping behavior that aims at solving the environmental problem. We did not, however, find evidence that the negative emotional response actually mediated the effect and shaped the behavior.

While health behaviors and environmental behaviors share many similarities, they also differ in some important aspects. Possibly, it is the differences between the two domains that may account for the fact that we did not find a mediating role of anticipated emotions. A main difference is that health behaviors usually produce personal risks. That is to say, the person who performs the unhealthy behavior is also the one who suffers the potential negative consequences. The consequences of environmental behaviors, in contrast, are collective. It has been proposed that environmental choices can be conceptualized as a social dilemma opposing individual and collective interests (van Vugt, van Lange, & Meertens, 1996). Likewise, it is usually not an individual action but the accumulated effects of collective actions that create an environmental problem. Thus, both the causation and the consequences of environmental problems are collective (Böhm & Pfister, 2008b; Pfister & Böhm, 2001). Travel mode choice, in contrast, is an individual decision. Possibly, focusing on the long-term consequences triggers collective emotions such as collective guilt and threat, which may be independent of the personal emotions that guide individual environmental behavior.

Emotions as well as intentions appear to be rather unaffected by the pleasantness of the circumstances of behaviors. A possible explanation might be that everyday behaviors such as transportation mode choice are highly habitual, and dictated by presumed constraints (Verplanken, Aarts, & van Knippenberg, 1997). Thus, focusing on the negative or positive aspects of a car ride may have no effect because people have long adapted to the ever-changing

conditions of their habitual behaviors. It might have been helpful had we obtained baseline measures for emotions and intentions before implementing the experimental manipulation. This would have allowed us to analyze more specifically what the habitual reactions of our participants to the various travel modes were and whether our manipulation induced changes in these habitual patterns.

A large proportion of our sample was female. Women have been found to experience emotions concerning behavioral outcomes more strongly than men (Eriksson & Simpson, 2010). Also, women tend to have weaker car habits and to be more willing to reduce car use (Matthies, Kuhn & Klöckner, 2002). These results may suggest that the effects that we found may be overestimated by our predominantly female sample. However, we believe that our sample had very positive attitudes towards cars, as suggested by the positive emotions that were associated with a car ride and unaffected by the negative car scenario. Our participants stem from a region that is strongly shaped by a major German car manufacturer and the university is not well connected to public transportation, which supports our belief. We do not have empirical evidence for it, though. Thus, an obvious need for further research is to investigate the role of attention and affective forecasting in a more balanced sample and also with respect to environmental behaviors that are less habitual and less restricted by circumstantial factors such as the availability of public transport.

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Footnotes

[1]Participants also rated the intensity of a number of concrete anticipated emotions (e.g., sadness, fear, regret, hope, joy, happiness). These concrete emotions formed two factors in a factor analysis, corresponding to positive and negative emotions, respectively. These two factors yielded the same results as the two overall ratings for positive and negative emotions and will therefore not be reported in this paper.

Tables

Table 1

Experimental Manipulation: Scenario Depicted in Slide Show

	Focus of Attention		
Valence of Experience	Behavior – Car	Behavior – Public Transport	Consequences
Positive	The protagonist travels to work by car and experiences a pleasurable car ride (e.g., comfort and fun of fast driving).	The protagonist travels to work by train and experiences a pleasurable train ride (e.g., relaxed reading, taking a nap).	The protagonist experiences a pleasant future app. 20 years from now during which car traffic was reduced, resulting in a clean, healthy, and stress-free environment.
Negative	The protagonist travels to work by car and experiences an unpleasant and stressful car ride (e.g., search for parking, traffic jams).	The protagonist travels to work by train and experiences an unpleasant and stressful train ride (e.g., delayed and crowded train, heavy luggage).	The protagonist experiences an unpleasant future app. 20 years from now during which car traffic increased; resulting in a polluted, unhealthy, and stressful environment (e.g., smog, illnesses, accidents).

Note: Each scenario existed in two versions with either a female or a male protagonist. Each participant watched a protagonist of his or her own sex.

Table 2

Mediation Analyses: Focus →Anticipated Emotion → Behavioral Intention

	Regression 1: IV → MV		Regression 2: IV → DV		Regression 3: IV + MV → DV		
	b(IV)	R^2	b(IV)	R^2	b(IV)	b(MV)	R^2
t1	Focus → anticipated positive emotions → intention to use car						
	-1.596	0.203	-0.486	.056	-0.440	0.033	0.054
	***	***	***	***	**	ns	***
	Focus → anticipated negative emotions → intention to use car						
	1.793	.235	-.486	.056	-.461	-.021	.055
	***	***	***	***	**	ns	***
	Focus → anticipated positive emotions → intention to use public transport						
	-1.596	.203	.422	.050	.441	-.007	.050
	***	***	***	***	***	ns	***
	Focus → anticipated negative emotions → intention to use public transport						
	1.793	.235	.422	.050	.452	-.011	.049
	***	***	***	***	***	ns	***
t2	Focus → anticipated positive emotions → intention to use car						
	-1.306	.167	-.271	.019	-.241	.024	.016
	***	***	*	*	+	ns	+
	Focus → anticipated negative emotions → intention to use car						
	2.002	.300	-.271	.019	-.334	.034	.017
	***	***	*	*	*	ns	+
	Focus → anticipated positive emotions → intention to use public transport						
	-1.306	.167	.196	.009	.179	-.021	.008
	***	***	+	+	ns	ns	ns
	Focus → anticipated negative emotions → intention to use public transport						
	2.002	.300	.196	.009	.263	-.036	.009
	***	***	+	+	*	ns	ns

Note. The independent variable focus was for this analysis dichotomized in behavior condition (coded as 0) versus consequences condition (coded as 1). R^2: adjusted R^2; IV: independent variable; DV: dependent variable; MV: mediator variable; b( ): unstandardized regression coefficient. ***: $p \leq .001$, **: $p \leq .01$, *: $p \leq .05$, +: $p \leq .08$.

Figures

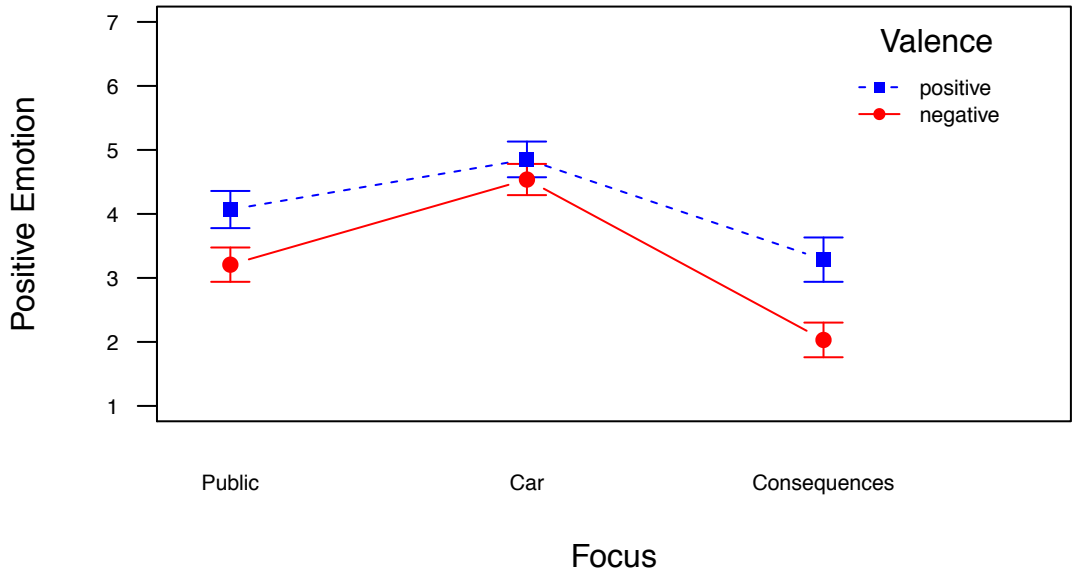

Figure 1. Intensity of positive anticipated emotions as a function of focus of attention and valence of experience; error bars represent 95% confidence intervals.

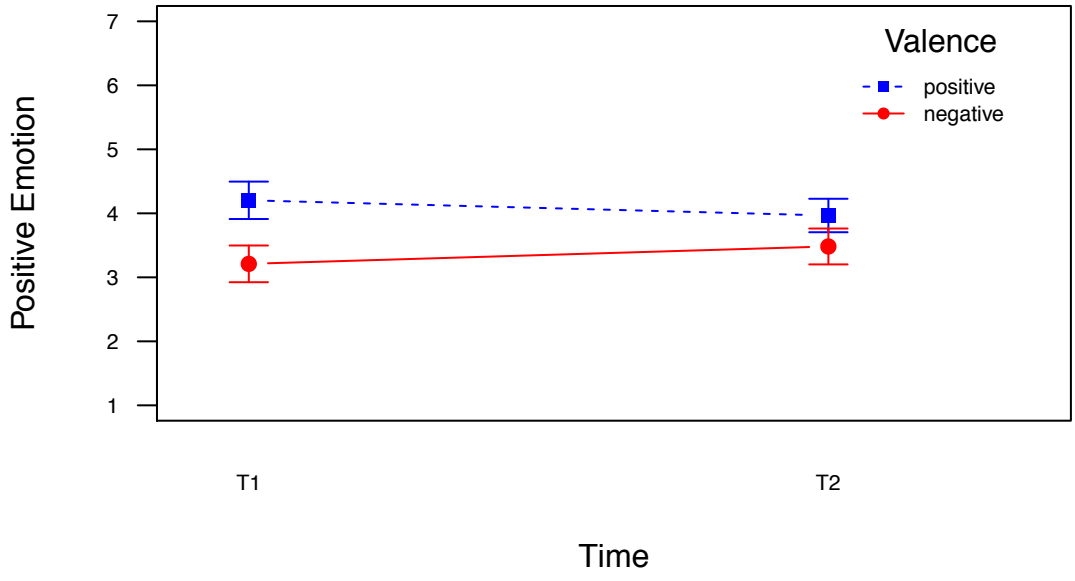

Figure 2. Intensity of positive anticipated emotions as a function of time of measurement and valence of experience; error bars represent 95% confidence intervals.

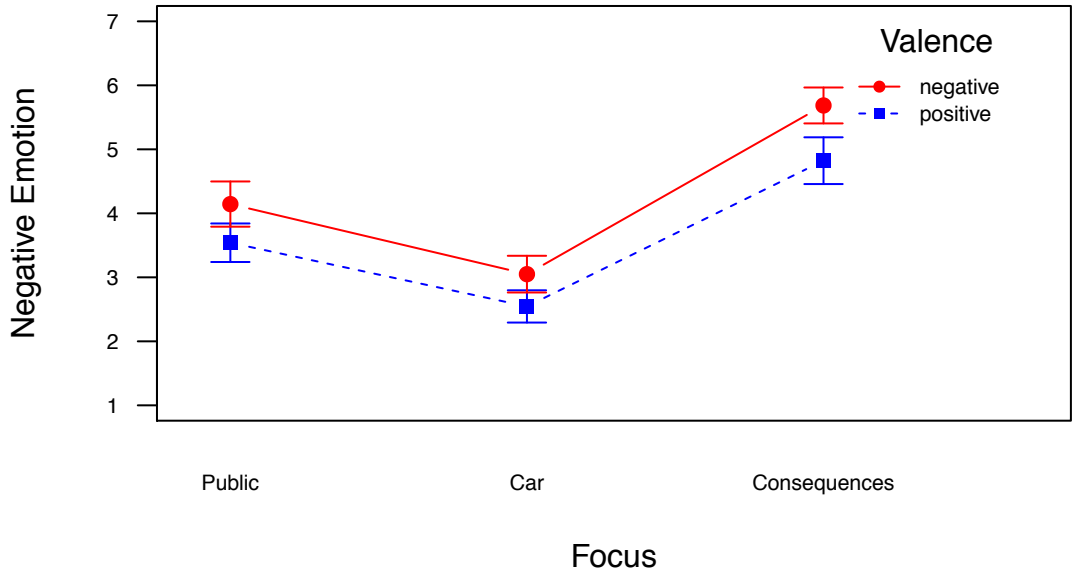

Figure 3. Intensity of negative anticipated emotions as a function of focus of attention and valence of experience; error bars represent 95% confidence intervals.

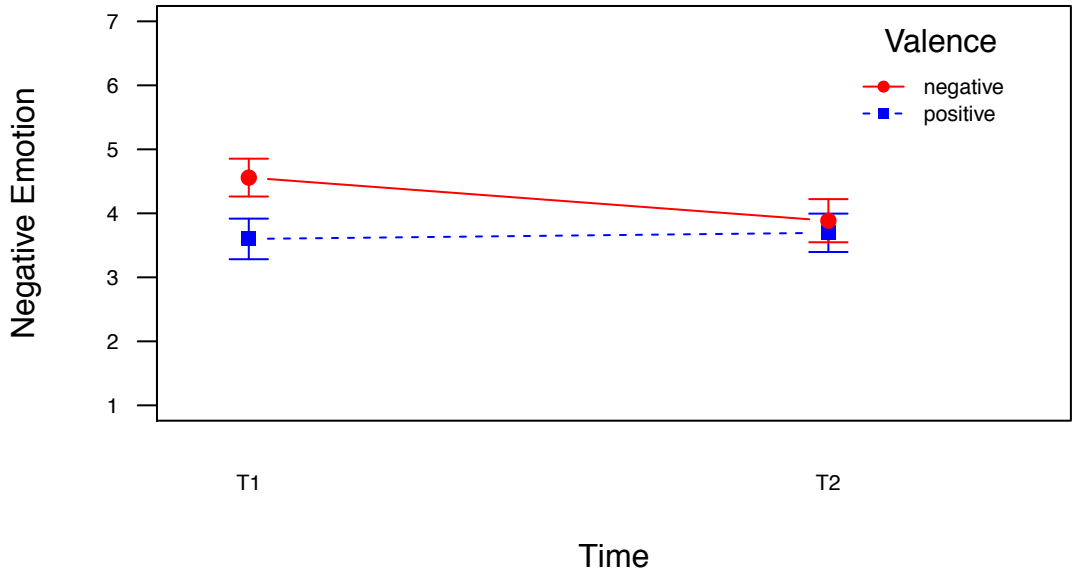

Figure 4. Intensity of negative anticipated emotions as a function of time of measurement and valence of experience; error bars represent 95% confidence intervals.

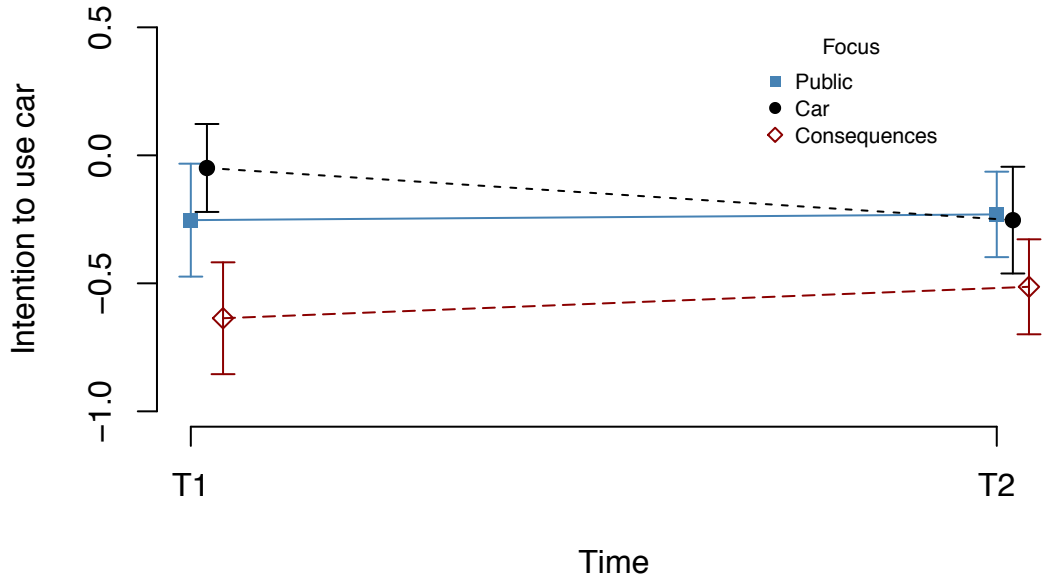

Figure 5. Intention to reduce car driving in the future as a function of time of measurement and focus of attention ; error bars represent 95% confidence intervals.

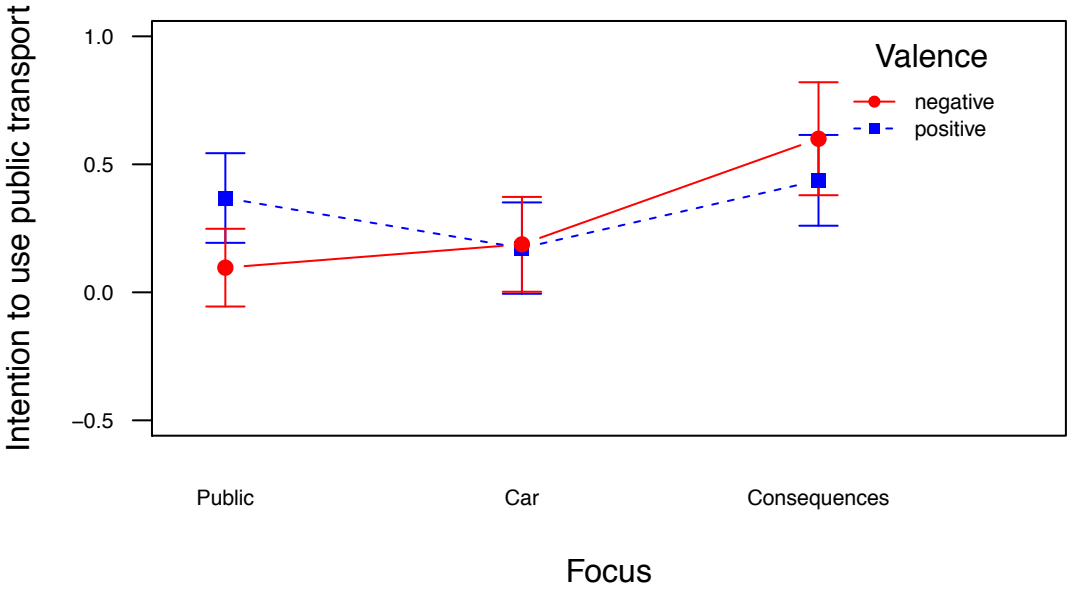

Figure 6. Intention to increase the use of public transport in the future as a function of focus of attention and valence of experience; error bars represent 95% confidence intervals.