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Anticipated Affect and Behavioral Choice

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Most research on the impact of affect on attitudes and behavior emphasizes the effect of past and present affective reactions. In this article we focus on anticipated, postbehavioral, affective reactions. The influence of anticipated affective reactions on a number of behaviors was investigated in the context of Ajzen's theory of planned behavior (Ajzen, 1985, 1991). Results showed that anticipated affective reactions predicted behavioral intentions independent from general attitudes (evaluations) toward the behavior. As expected, anticipated affective reactions were more negative than attitudes toward the behavior for behaviors with negatively valued consequences and more positive for behaviors with positively valued consequences. Moreover, for three of the four investigated behaviors, anticipated affective reactions explained a significant proportion of variance in behavioral expectations, over and above the components of the theory of planned behavior. On average, behavioral expectations explained more than half of the variance in actual behavior, which was measured 4 weeks later. Implications of these findings for our understanding of the attitude concept, and more practical implications for behavioral change programs, are discussed.

The theories of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and planned behavior (Ajzen, 1985, 1991) assume an informational foundation of human conduct. The information people have about their world, represented by their beliefs, is supposed to determine people's attitudes, their perceptions of social pressure and control, their behavioral intentions, and ultimately their behavior. However, a substantial body of evidence suggests that human behavior is better understood if, in addition to salient beliefs, affective processes are taken into

consideration (e.g., Abelson, Kinder, Peters, & Fiske, 1982; Breckler & Wiggins, 1989; Edwards, 1990; Millar & Tesser, 1986, 1989; Pfister & Böhm, 1992; Zajonc, 1980). The theory of reasoned action is rather unspecific about the role of affect, as illustrated by the following quotation:

The terms "affect" and "evaluation" are used synonymously throughout this book. Although it might be argued that there is a difference between a person's judgment that an object makes him feel good and his evaluation that the object is good, there is little evidence to suggest that a reliable empirical distinction between the two variables can be made. (Fishbein & Ajzen, 1975, p. 11)

However, a recent study by Breckler and Wiggins (1989) indicates that this empirical distinction can be made quite reliably. In their study, participants were asked to use the same semantic differentials (e.g., "bad-good") to indicate their evaluation of a number of objects (attitude object *is* . . .) and their feelings toward these objects (attitude object *makes me feel* . . .). Although considerable variation was found, discriminant validity of affect and evaluation was supported for each of the objects under investigation. Other recent approaches also distinguish between affect and evaluation (e.g., Millar & Tesser, 1986, 1989; Zanna & Rempel, 1988). Within the framework of Ajzen's theory of planned behavior, the terms *affect* and *evaluation* are also no longer used interchangeably. In this framework, the term *attitude* is reserved strictly for the overall evaluative response (Ajzen, 1989). However, the role of affective processes is still treated rather narrowly. In a recent article Ajzen added the following footnote:

The role of affect is not spelled out very clearly in the Ajzen-Fishbein framework. Affective reactions may depend at least in part on cognitions and, like cognitions, they may feed into the overall evaluative response to an attitude object. In addition, affect may be associated with the perceived attributes of an object and may thus be partly responsible for the evaluative direction and intensity of a person's beliefs. (Ajzen, 1989, p. 248)

Several studies suggest that affect can predict behavior over and above beliefs and evaluations. Breckler and Wiggins (1989, Study 2) investigated the discriminant validity of affect and evaluation in the domain of blood donation and also investigated how each related to a number of self-reported behaviors concerning blood donation. The relation with behavior was found to be much stronger for affect than for evaluation. Multiple regression analysis revealed that affect and evaluation predicted partially independent proportions of variance in blood-donation-related behaviors and, moreover, that the impact of affect was substantially greater than the impact of evaluation. In the study by Abelson and his colleagues (1982), affect was found to be dominant over beliefs in determining voting behavior. More specifically, the way politicians made respondents feel in the past (e.g., happy,

hopeful, angry, afraid) was a better predictor of respondents' voting preferences than the traits respondents ascribed to the politicians (e.g., honest, open-minded, immoral, weak). Similarly, Pfister and Böhm (1992) found that judgments about popular target persons were predicted significantly better if, in addition to concrete features (e.g., intelligence and physical attractiveness), emotions associated with these persons (e.g., joy and anger) were included as predictors. These findings suggest that, at least for some behaviors, the predictive ability of the theory of planned behavior may be enhanced if affective factors are incorporated in the model.

Studies investigating affective processes in an attitudinal context have mainly been concerned with the impact of affect on overall attitudes toward persons, objects, or issues. Moreover, most studies focused on past affective reactions. For example, Abelson and his colleagues (1982) investigated whether the feelings participants had in the past about presidential candidates predicted their present evaluations of the candidates. Ajzen and Fishbein (1977) demonstrated that the prediction of a behavior will be more successful when the predictor variable corresponds to the predicted behavior in target, action, context, and time elements. Thus, the prediction of behavior requires the measurement of affective reactions with respect to the relevant behavior. Because we deal with future behavior, it seems appropriate to investigate the impact of anticipated affective reactions.

The purpose of this research is to investigate the role of anticipated, postbehavioral, affective reactions in the context of Ajzen's theory of planned behavior (Ajzen, 1985, 1991). The theory of planned behavior postulates that a person is motivated to perform a particular behavior to the extent that he or she has a positive attitude toward the behavior, perceives social pressure to perform the behavior, and expects to have control over performing the behavior. Ajzen's theory has successfully been applied to a wide range of behaviors, including common activities such as doing the laundry and shopping with a friend (Madden, Ellen, & Ajzen, 1992), food consumption (Sparks, Hedderly, & Shepherd, 1992), as well as the violation of traffic regulations (Parker, Manstead, Stradling, Reason, & Baxter, 1992) and various dishonest behaviors (Beck & Ajzen, 1991). The theory has also been applied to health behaviors such as quitting smoking (De Vries, Dijkstra, & Kuhlman, 1988), weight reduction (Schifter & Ajzen, 1985), limiting infants' sugar intake (Beale & Manstead, 1991), and condom use (e.g., Richard, Van der Pligt, & De Vries, 1995a; Schaalma, Kok, & Peters, 1993).

Anticipated affective reactions may enhance the predictive ability of Ajzen's theory of planned behavior. This is most likely to be the case when there is a discrepancy between the evaluative response toward a particular behavior (i.e., the attitudinal response) and the anticipated affective reaction after this behavior. In some domains, evaluations and anticipated affective reactions coincide. Sometimes people have a favorable (unfavorable) evaluation of a specific behavior and also anticipate positive (negative) feelings after carrying out the behavior. For instance,

a person may like the act of buying new clothes and also expect to feel good afterward. In other cases, however, evaluations and anticipated affective reactions do not coincide. A person's anticipated affective reactions after a given behavior may be radically different from his or her evaluation of the behavior. For example, people may like (i.e., have a positive evaluation of) the idea of going out with friends, drinking alcohol, and having a good time, but may also realize that they will regret it early the next morning when having to get up for work. Or, a person may strongly dislike going to the dentist, but at the same time anticipate feelings of pride and relief after the visit.

The attitudinal component of the theory of planned behavior differs from anticipated affective reactions in two respects. First, they are distinct in the sense of the evaluation-affect distinction described above. Second, these concepts differ in their time perspective with respect to the behavior under consideration. Looking at a behavior from a different time perspective may cause different aspects of the behavior to be salient. Specifically, this could mean that when a person expresses an attitude toward a given behavior (i.e., evaluates the behavior) the behavioral act itself is relatively salient. On the other hand, when a person thinks about feelings experienced after the target behavior the (possible) consequences of the behavior, rather than the behavioral activity, are likely to be most salient.

In this study we measure participants' general evaluative responses (i.e., attitudes) toward a number of behaviors, as well as their general affective reactions toward these behaviors and their anticipated affective reactions after these behaviors. These three concepts differ in terms of time perspective, affect-evaluation distinction, or both. The discriminant validity of these three concepts is investigated. Inclusion of both general affective reactions and anticipated affective reactions allows us to investigate the predictive ability of anticipated affective reactions (rather than general affect) over and above the components of the theory of planned behavior.

A number of behaviors were selected in which we expected attitudes toward the target behavior to differ from anticipated feelings after the target behavior. These are eating "junk food," using soft drugs (marijuana, hashish), drinking alcohol, and studying hard. The activity of performing these behaviors is assumed to be relatively salient when participants indicate their attitudes or general feelings toward these behaviors. On the other hand, we assume that the consequences of these behaviors are relatively salient when participants indicate how they expect to feel afterwards. Thus, people may have relatively pleasant feelings toward eating junk food because they like the taste of this food, whereas they may expect to feel relatively unpleasant afterward because they realize that junk food is not particularly good for their health. The first three behaviors (junk food, drinking alcohol, using soft drugs) can have negative consequences and the last behavior (studying hard) can have positive consequences. Therefore we expected people's anticipated feelings after eating junk food, using soft drugs, and drinking alcohol to be on

average more negative than their attitudes and general affective reactions toward these behaviors. We also expected people's anticipated feelings after studying hard to be on average more positive than their attitudes and general affect toward this behavior. Further, we investigate whether anticipated affective reactions have a partially independent causal role in the determination of the target behaviors. More specifically, it is tested whether in these domains where there is a discrepancy between attitudes toward and anticipated feelings after target behaviors, the predictive power of the theory of planned behavior can be improved if anticipated, postbehavioral, affective reactions are incorporated in the model.

METHOD

Participants

Participants were 347 female and 159 male first-year psychology students of the University of Amsterdam, who participated in the study as part of a course requirement. Age ranged from 18 to 48 years with a median of 20.

Procedure

Two questionnaires were administered over a period of 4 weeks. Participants responded anonymously. The first questionnaire included measures of behavioral expectations,¹ attitudes, general affective reactions, anticipated affective reactions, perceived behavioral control, and subjective norms with respect to performing each of the following behaviors in the 4 weeks after the study:

- Eating junk food (french fries, hamburgers, etc.).
- Using soft drugs (marijuana, hashish, etc.).
- Going out late and drinking a lot of alcohol.
- Studying hard.

The measures of behavioral expectations, attitudes, general affective reactions, and anticipated affective reactions appeared first in the questionnaire, and the order of

¹It should be noted that although the theory of planned behavior focuses on behavioral intentions, our dependent variable was a measure of behavioral expectations. There is evidence to suggest, however, that behavioral expectations are better predictors of behavior than are behavioral intentions (Warshaw & Davis, 1985a, 1985b; Sheppard, Hartwick, & Warshaw, 1988). Moreover, especially when behaviors are under limited volitional control, behavioral expectations may be more accurate in predicting behavior (Ajzen, 1985; Morojele & Stephenson, 1992).

these measures was counterbalanced across participants. These measures were followed by the measures of perceived behavioral control and subjective norms, respectively. Separate pages were used to measure each of the constructs. In the second questionnaire, participants were asked to report how often they had performed each of the four behaviors during the preceding 4 weeks.

Measures

Behavioral expectations. Participants were asked how often they expected to perform each of the target behaviors in the coming 4 weeks. Responses were given on 7-point scales ranging from 1 (*never*) to 7 (*very often*).

Attitudes. Participants were instructed at the top of the attitude page that the questions on that page referred to their beliefs toward the target behaviors. Participants evaluated each of the four target behaviors on three semantic differential scales: pleasant-unpleasant, nice-awful, good-bad. We used LISREL to analyze the data. LISREL offers the possibility to estimate relations between latent constructs. A precondition is that the constructs are represented by multiple indicators. Responses to the three scales were used as multiple indicators of attitudes.

General affective reactions. On top of the affective reactions page, participants were instructed that the questions on that page referred to their general feelings toward the target behaviors. Participants indicated their feelings toward each of the target behaviors using the same semantic differential scales as used for the evaluation of the target behaviors. Responses to these scales were used as multiple indicators of general affective reactions.

Anticipated affective reactions. In the top corner of the anticipated affective reactions page, participants were instructed that the questions on that page referred to the feelings that they would have after performing the target behaviors. Participants used the earlier mentioned semantic differential scales to indicate their anticipated affective reactions. Responses to the three semantic differential scales were used as multiple indicators of anticipated affective reactions.

Perceived behavioral control. With respect to the domain *studying hard*, participants were asked: "Suppose that you want to study hard. Will you manage to do so?" Responses were given on a 7-point scale ranging from 1 (*no, absolutely*

not) to 7 (*yes, absolutely*). With respect to the domains eating junk food, using soft drugs, and drinking alcohol, participants were asked: "Suppose, you don't want to. . . Will you manage to refrain from . . .?" Responses were given on a 7-point scale anchored 7 (*no, absolutely not*) and 1 (*yes, absolutely*) and were used as the first indicator of perceived behavioral control. For each domain the second indicator consisted of the item "How much control do you have over . . .?" Responses to this item were given on a 7-point scale anchored 7 (*no control*) and 1 (*complete control*). (Scale values were reversed for the domain *studying hard*.)

Subjective norms. Subjective norms were measured by asking the participants to respond to the item: "If I would . . . , most people who are important to me would generally:", with scale anchors 1 (*disapprove*) and 7 (*approve*). In order to get a second indicator of subjective norms, participants were asked to indicate on a 7-point scale whether the important others would *recommend* (7) or *discourage* (1) each of the target behaviors.

Self-reported behavior. In the second questionnaire, administered 4 weeks later, participants were asked how often they had carried out each of the four target behaviors during the preceding 4 weeks. Responses were given on 7-point scales anchored 1 (*never*) and 7 (*very often*).

Analyses

The LISREL VII program (Jöreskog & Sörbom, 1988) was used to test the goodness-of-fit of the models and to estimate the models' parameters. Of the many available methods of estimation for model parameters and overall fit, the Maximum Likelihood (ML) method is most commonly used (Breckler, 1990). A major advantage of this method is the possibility to use the χ^2 goodness-of-fit index to test the overall fit of the models. A disadvantage, however, is that this method is based on the assumption that the observed variables have a multinormal distribution. Parameter estimates are robust against departures from normality, but this does not apply to standard errors and the χ^2 measure (Jöreskog & Sörbom, 1988). An alternative for the ML method is the Weighted Least Squares (WLS) method, which is asymptotically distribution free (Browne, 1984). When large samples are available, this method can be used to compute asymptotically correct χ^2 s and standard errors in the case of continuous variables that depart from normality. As this is the case in our study, the WLS method was applied, using the PRELIS computer program (Version 1.7, Jöreskog & Sörbom, 1988).²

²The weight and covariance matrices used in the study are available on request from the authors.

The χ^2 test can be used to assess the overall fit of the proposed model to the data. The χ^2 statistic indicates the adequacy of the proposed model in terms of its ability to re-create the observed covariance matrix. The larger the difference between the re-created and the observed covariance matrix, the larger the χ^2 . If the χ^2 is large relative to its associated degrees of freedom, the model should be rejected. Thus, a significant χ^2 indicates inadequate fit of the model to the data. However, the power of the χ^2 test increases with sample size, and therefore any model will be rejected if the sample gets sufficiently large. Therefore, in addition to the asymptotically correct χ^2 statistic, the adjusted goodness-of-fit index (AGFI, Jöreskog & Sörbom, 1988), the normed fit index (NFI, Bentler & Bonett, 1980), and the incremental fit index (IFI, Bollen, 1989) are reported. These indices are less sensitive to sample size (see Bollen, 1990). AGFI and NFI have a maximum value of 1, which indicates perfect fit of the model to the data. Although the IFI may exceed 1, it will be about 1 for a valid model (Bollen, 1990).

The models presented in Figures 1 to 5 should be interpreted as follows. The large circles refer to latent factors, the small circles to the residual variance that is not accounted for by the common factor, and the rectangles refer to measured variables. The two-way arrows indicate that there can be a correlation between the constructs without an assumed causal relationship. The one-way arrows from the large circles to the rectangles refer to factor loadings, and the one-way arrows between large circles refer to regression coefficients. Because all parameters are presented in standardized metric, the regression parameters should be interpreted as β weights, the remaining parameters as correlation coefficients. β weights are accompanied by zero-order correlation coefficients in brackets. The squared correlation between a measured variable and its underlying construct may be interpreted as the reliability of the measured variable.

TABLE 1
Mean Scores for Attitudes, General Affective Reactions,
and Anticipated Affective Reactions

	Attitudes	General Affective Reactions	Anticipated Affective Reactions	Multivariate F(2, 504)
Eating junk food	4.84 _a	4.62 _b	3.70 _c	203.10
Using soft drugs	4.16 _a	4.14 _a	3.66 _b	54.27
Drinking alcohol	5.02 _a	5.00 _a	3.07 _b	737.25
Studying hard	4.27 _a	4.32 _a	6.38 _b	584.85

Note. $N = 506$; all multivariate F s significant at $p < .001$; means are based on 7-point scales, higher scores indicating more favorable judgments; means with different subscripts (horizontally) are significantly different at $p < .001$ (means with the same subscripts, $p > .25$).

TABLE 2
Tests of Discriminant Validity of Attitudes, Affective Reactions,
and Anticipated Affective Reactions

	One-Factor Model		Two-Factor Model				
	$\chi^2(6)$	p	$\chi^2(5)$	p	$\chi^2_{\text{dif}(1)}$	$p <$	r
Attitudes and Affective Reactions							
Eating junk food	51.61	< .001	5.15	> .39	46.46	< .001	.84
Using soft drugs	60.78	< .001	4.81	> .43	55.97	< .001	.92
Drinking alcohol	46.54	< .001	8.14	> .14	38.40	< .001	.91
Studying hard	49.38	< .001	6.24	> .28	43.14	< .001	.82
Attitudes and Anticipated Affective Reactions							
Eating junk food	173.34	< .001	8.92	> .11	164.42	< .001	.50
Using soft drugs	137.73	< .001	14.21	> .01	123.52	< .001	.73
Drinking alcohol	220.55	< .001	28.73	< .001	191.82	< .001	.47
Studying hard	82.93	< .001	1.10	> .95	81.83	< .001	.23
Affective Reactions and Anticipated Affective Reactions							
Eating junk food	150.26	< .001	16.34	> .006	133.92	< .001	.55
Using soft drugs	119.25	< .001	11.68	> .03	107.57	< .001	.75
Drinking alcohol	205.46	< .001	19.19	> .002	186.27	< .001	.50
Studying hard	87.30	< .001	3.95	> .55	83.35	< .001	.24

Note. $N = 506$; χ^2_{dif} = difference of χ^2 test with respect to the one-factor and two-factor models; r = correlation between the two factors.

RESULTS

Results did not differ as a function of the order in which the measures were presented in the first questionnaire. Table 1 shows the mean scores for attitudes, general affective reactions, and anticipated affective reactions. Univariate F tests revealed that, as expected, for the domains eating junk food, using soft drugs, and drinking alcohol, anticipated affective reactions were significantly more negative than both the attitudes and general affective reactions toward the target behaviors. As expected, anticipated affective reactions after studying hard were more positive than both attitudes and general affective reactions toward this behavior. Furthermore, attitudes toward the target behaviors did not differ significantly from the general affective reactions toward the target behaviors, except for the domain eating junk food. We performed LISREL analyses to test the discriminant validity of attitudes, general affective reactions, and anticipated affective reactions. In these analyses, we allowed the error terms of similar semantic differential scales to be correlated (see Figure 1). This is a reasonable assumption because the error terms may represent not only true measurement error but also scale-specific measurement error (Jöreskog & Sörbom, 1988). Table 2 summarizes the results of the LISREL analyses. In most cases the two-factor models fitted the data

FIGURE 1 Test of the discriminant validity of attitudes, general affective reactions, and anticipated affective reactions.

FIGURE 2 The model of eating junk food. Parameter estimates are standardized. All parameters are significant at $p < .01$, except ^ans, ^b $p < .10$.

reasonably well, whereas all one-factor models were statistically rejected (with very high χ^2 values associated with the models). Moreover, the difference of χ^2 test revealed that in all cases the two-factor model fitted the data significantly better than the one-factor model. Results show that, although general affective reactions toward a behavior are not equivalent to attitudes toward that behavior, they are generally strongly correlated ($.82 < r < .92$). On the other hand, anticipated affective reactions differ substantially from both attitudes and general affective reactions. Overall, attitudes and general affective reactions are only moderately correlated to anticipated affective reactions ($.23 < r < .75$).

The Impact of Anticipated Affective Reactions

Findings show that evaluations of and general affective reactions toward behaviors are strongly correlated, but not equivalent. Therefore, if anticipated affective reactions are found to increase the predictive power of the theory of planned behavior, with the theory's attitudinal component operationalized as an evaluation of the target behavior, it could mean that this increase is caused by affect and not necessarily by anticipated affect. For this reason, we conducted two series of tests: one with the attitudinal component operationalized as the evaluation of the target behaviors, and one with the attitudinal component operationalized as general affect toward the target behaviors.³ The results of these two series of tests were essentially equivalent; the pattern of significant correlations and regression coefficients were nearly identical in both series of analyses. For presentation purposes we therefore report only the results of the analyses in which the attitudinal component was operationalized (in line with the theory of planned behavior) as an evaluation of the target behaviors. Thus this first step of our analysis confirms the discriminant validity of our measures of (anticipated) affect associated with the specific behaviors and the evaluation or attitude toward these behaviors. Next we test whether anticipated affect plays an independent role in predicting behavioral expectations and behavior.

Figures 2 to 5 summarize the models of eating junk food, using soft drugs, drinking alcohol, and studying hard, respectively.⁴ The overall fit measures of these

³We also tested the models that included evaluations, anticipated affect, and general affect, but in these cases the LISREL computer program did not converge to admissible solutions, most likely because of problems with multicollinearity.

⁴Although we had only one indicator of behavioral expectations, we were still able to include measurement error of this indicator in the model because of the overidentifying constraints in the model (see Bollen, 1989; Jöreskog & Sörbom, 1988). Note also that in these models, the parameters reflecting correlations between the error terms of similar semantic differential are fixed. Setting free these parameters does not improve the fit markedly. We used the WLS method to estimate parameters and overall fit. We also performed a LISREL analysis using the more commonly employed ML method, but this yielded similar results.

TABLE 3
Overall Fit Indices of the Models

	$\chi^2(44)$	<i>p</i>	AGFI	NFI	IFI
Eating junk food	61.22	> .04	.952	.993	.998
Using soft drugs	73.84	> .003	.940	.998	.999
Drinking alcohol	80.68	> .001	.948	.997	.999
Studying hard	45.34	> .41	.959	.992	1

Note. *N* = 506; AGFI = adjusted goodness-of-fit index; NFI = normed fit index; IFI = incremental fit index.

FIGURE 3 The model of using soft drugs. Parameter estimates are standardized. All parameters are significant at $p < .01$, except ^b $p < .10$.

FIGURE 4 The model of alcohol use. Parameter estimates are standardized. All parameters are significant at $p < .01$, except ^b $p < .10$, ^c $p < .05$.

models are presented in Table 3. The χ^2 statistics of the models of using soft drugs and drinking alcohol are relatively large, but the other goodness-of-fit indices indicate good fit to the data. All fit indices of the models of eating junk food and studying hard, including the χ^2 statistics, indicate good fit. Thus, the proposed models seem to be plausible representations of the data. We can see from Figures 2 to 4 that anticipated affective reactions predicted an independent and significant proportion of variance in the expectations to eat junk food, to use soft drugs, and to drink alcohol in the coming 4 weeks. Anticipated affective reactions did not contribute to the prediction of expectations to study hard in the coming 4 weeks, however (see Figure 5). In all cases the proportions of explained variance in both behavioral expectations and behavior were substantial. On average 56.8% of the variance in behavioral expectations, and 57.5% of the variance in behavior was explained.

FIGURE 5 The model of studying hard. Parameter estimates are standardized. All parameters are significant at $p < .01$, except ^ans, ^c $p < .05$.

CONCLUSIONS AND DISCUSSION

Results showed that anticipated affective reactions were more negative than attitudes and general affective reactions toward eating junk food, using soft drugs and drinking alcohol, and more positive than attitudes and general affective reactions toward studying hard. Attitudes toward the target behaviors did not differ significantly from the general affective reactions toward these behaviors, except for eating junk food. Although general affective reactions toward the target behaviors were not equivalent to evaluations of that behavior, they were generally very strongly correlated ($.82 < r < .92$). Anticipated affective reactions, however, differed substantially from both attitudes and general affective reactions. Generally, attitudes and general affective reactions showed only moderate correlations with anticipated affective reactions ($.23 < r < .75$). These results suggest that attitudes

differ from anticipated affective reactions mainly because of the different time perspective of the latter.

For three of the four investigated domains, anticipated affective reactions predicted a significant proportion of variance in behavioral expectations, over and above the components of the theory of planned behavior. Thus, the results of our study indicate that the predictive power of the theory of planned behavior may improve if anticipated, postbehavioral, affective reactions are incorporated in the model. In this research we focused on anticipated affective reactions at a general level (i.e., expecting to feel good vs. expecting to feel bad). Other researchers have emphasized the impact of more specific anticipated feelings on human decision making, including guilt, sadness, and anger (Baron, 1992); regret and disappointment (Loomes & Sugden, 1986); embarrassment and pride (Simonson, 1989); and envy and gloating (Loewenstein, Thompson, & Bazerman, 1989). Richard, Van der Pligt, and De Vries (1995b) investigated the effect of anticipated worry and regret on sexual risk-taking behavior, in the context of the theory of planned behavior. Their results indicated that these specific anticipated affective reactions accounted for a substantial proportion of variance in behavioral expectations, again partially independent of the components of the theory of planned behavior. Further evidence for the importance of anticipated affective reactions in the context of the theory of planned behavior comes from a recent study by Manstead and Parker (1993). Their study assessed the ability of the theory of planned behavior to account for drivers' intentions to commit driving violations and also investigated the role of anticipated affective reactions. In line with our findings, results showed that anticipated affective reactions accounted for a substantial proportion of the variance in intentions over and above the components of the theory of planned behavior.

Next, we would like to mention some practical implications. Results in Table 1 show that anticipated affective reactions are negative (below the scale midpoint) and attitudes are positive (above the scale midpoint) for the behaviors with negative consequences (i.e., eating junk food, using soft drugs, and drinking alcohol). Thus, the attitudes (and general affective reactions) toward and the anticipated feelings after these behaviors reflect contradictory action tendencies. This could be utilized in designing behavioral change programs, by using interventions that increase the salience of negative affective consequences of the behavior. One way to do this would be to ask people to imagine how they would feel after a particular action. If people become increasingly aware that particular actions can lead to negative feelings afterwards, they will be more likely to abandon these negative behaviors. We argued that the activity of performing a behavior is relatively salient when persons indicate their attitudes or general affective reactions toward the behavior, and that the consequences of the behavior are relatively salient when persons indicate how they expect to feel after the behavior. We investigated three behaviors with possible negative consequences (i.e., eating junk food, using soft drugs, and drinking alcohol). In these behaviors anticipated affective reactions predicted

significant proportions of variance over and above the components of the theory of planned behavior. Thus it appears that anticipated affective reactions partly determine behaviors characterized by a discrepancy between positive affective reactions toward the behavioral activity and postbehavioral negative consequences.

We also investigated one behavioral activity with positive consequences (studying hard), but found no evidence for the predictive ability of anticipated affective reactions. One reason for this failure could be the relatively low variance in the scores on the anticipated affect variable. The average variance in this variable for the other behaviors is 3.6 times the variance in the scores on the anticipated affect variable for studying hard. The limited role of anticipated affect in this case is not caused by its overlap with other measures. It could be that people are less likely to say to themselves "Oh, it will be a pain when I am doing it, but I will feel good when it is all over!" Social desirability could also play a role; saying that you will feel good after you study is like admitting you do not like to study and an admission of doubt whether you will do it at all.⁵ Another possible explanation is that anticipated affective reactions and attitudes are less inconsistent or less contradictory in the case of studying hard (i.e., both are located on the positive side of the continuum). It could be that attitudes and anticipated affective reactions need to be inconsistent or contradictory for anticipated affective reactions to explain additional variance. Finally, it is possible that anticipated affective reactions are more important for behaviors with negative consequences than for behaviors with positive consequences. It should be that anticipated affect works best when it is negative, because of "loss aversion," or as Kahneman and Tversky (1979) put it, because losses loom larger than gains. More systematic research addressing this positive-negative asymmetry is needed. Theoretically, anticipated positive feelings can also be important for the prediction of behavior. In particular, anticipated positive feelings could motivate people to not perform a behavior with negative consequences. Thus, a person may want to give up the habit of smoking cigarettes in order to gain a sense of pride or achievement. A large scale study of smokers intending to stop smoking provides support for this idea. Sutton, Marsh, and Matheson (1990) found that anticipated positive affective states discriminated best between intenders and nonintenders.

Next we would like to discuss the conceptual distinction between attitudes and anticipated affective reactions. Statistical analyses provided strong evidence for the discriminant validity of these constructs. Nevertheless, it might be argued that because these constructs both reflect (affective) judgments of the target behavior, their conceptual distinction is not necessary. One could prefer to incorporate both elements in one single attitude concept, because this would result in a theory of human behavior that is more parsimonious at the conceptual level. It is important

to note, however, that an attitude should then be conceptualized as consisting of different, sometimes contradictory affective components. This means that a person can hold more than one attitude toward the same behavior. Similar notions have been expressed by Salancik (1982; Salancik & Conway, 1975) and more recently by Zanna and Rempel (1988). When different aspects of a behavior, or different sources of information concerning the behavior, are made salient, this can result in the expression of different attitudes. Following this line of reasoning, our major argument in this article would be that different time perspectives can make different aspects of a behavior salient. These different aspects of the behavior reflect different attitudes that can, independently, affect behavior.

Finally, it is interesting to relate our findings to the literature on counterfactual thinking. Recently, Boninger, Gleicher, and Strathman (1994) argue that people who use counterfactuals to understand and plan are more likely to change their subsequent behavior. Moreover, they suggest that individuals may engage in the anticipatory simulation of events and the feelings that these would engender, which would result in a reassessment of their behavioral preferences. It could well be that our manipulation of simply asking participants to anticipate their feelings after the behavioral acts makes these feelings salient and this may influence the decision to engage in these behaviors.

More research is needed to disentangle the effects of anticipatory affective reactions and those of anticipatory cognitions about the possible negative consequences of the behaviors. We are currently investigating the role of anticipatory affect versus cognitions as determinants of behavior.

REFERENCES

- Abelson, R. P., Kinder, D. R., Peters, M. D., & Fiske, S. T. (1982). Affective and semantic components in political person perception. *Journal of Personality and Social Psychology*, 42, 619-630.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.
- Ajzen, I. (1989). Attitude structure and behavior. In A. J. Pratkanis, S. J. Breckler, & A. G. Greenwald (Eds.), *Attitude structure and function* (pp. 241-274). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84, 888-918.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Baron, J. (1992). The effect of normative beliefs on anticipated emotions. *Journal of Personality and Social Psychology*, 63, 320-330.
- Beale, D. A., & Manstead, A. S. R. (1991). Predicting mothers' intentions to limit frequency of infants' sugar intake: Testing the theory of planned behavior. *Journal of Applied Social Psychology*, 21, 409-431.

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- Beck, L. & Ajzen, I. (1991). Predicting dishonest actions using the theory of planned behavior. *Journal of Research in Personality*, 25, 285-301.
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness-of-fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-600.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Bollen, K. A. (1990). Overall fit in covariance structure models: Two types of sample size effects. *Psychological Bulletin*, 107, 256-259.
- Boninger, D. S., Gleicher, F., & Strathman, A. (1994). Counterfactual thinking: From what might have been to what may be. *Journal of Personality and Social Psychology*, 67, 297-307.
- Breckler, S. J. (1990). Applications of covariance structure modeling in psychology: Cause for concern? *Psychological Bulletin*, 107, 260-273.
- Breckler, S. J., & Wiggins, E. C. (1989). Affect versus evaluation in the structure of attitudes. *Journal of Experimental Social Psychology*, 25, 253-271.
- Browne, M. W. (1984). The decomposition of multitrait-multimethod matrices. *British Journal of Mathematical and Statistical Psychology*, 37, 1-21.
- De Vries, H., Dijkstra, M., & Kuhlman, P. (1988). Self-efficacy: The third factor besides attitude and subjective norm as a predictor of behavioral intentions. *Health Education Research*, 3, 273-282.
- Edwards, K. (1990). The interplay of affect and cognition in attitude formation and change. *Journal of Personality and Social Psychology*, 59, 202-216.
- Fishbein, M., & Ajzen, I. (1975). *Beliefs, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Jöreskog, K. G., & Sörbom, D. (1988). *LISREL 7: A guide to the program and applications*. Chicago: SPSS Inc.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: Analysis of decision under risk. *Econometrica*, 47, 263-291.
- Loewenstein, G. F., Thompson, L., & Bazerman, M. H. (1989). Social utility and decision making in interpersonal contexts. *Journal of Personality and Social Psychology*, 57, 426-441.
- Loomes, G., & Sugden, R. (1986). Disappointment and dynamic consistency in choice under uncertainty. *Review of Economic Studies*, 53, 271-282.
- Madden, T. J., Ellen, P. S., & Ajzen, I. (1992). A comparison of the theory of planned behavior and the theory of reasoned action. *Personality and Social Psychology Bulletin*, 18, 3-9.
- Manstead, A. S. R., & Parker, D. (1993, September). *Extending the theory of planned behavior: The role of moral norm and anticipated regret*. Paper presented at the 10th general meeting of the European Association of Experimental Social Psychology, Lisbon, Portugal.
- Millar, M. G., & Tesser, A. (1986). Effects of affective and cognitive focus on the attitude-behavior relation. *Journal of Personality and Social Psychology*, 51, 270-276.
- Millar, M. G., & Tesser, A. (1989). The effects of affective consistency and thought on the attitude behavior relation. *Journal of Experimental Social Psychology*, 25, 189-202.
- Morojele, N. K., & Stephenson, G. M. (1992). *Expectations, intentions, volitional control and addictions, and the theory of planned behavior*. Unpublished manuscript, Institute of Social and Applied Psychology, University of Kent.
- Parker, D., Manstead, A. S. R., Stradling, S. G., Reason, J. T., & Baxter, J. S. (1992). Intention to commit driving violations: An application of the theory of planned behavior. *Journal of Applied Psychology*, 77, 94-101.
- Pfister, H., & Böhm, G. (1992). The function of concrete emotions in rational decision making. *Acta Psychologica*, 80, 199-211.
- Richard, R., Van der Pligt, J., & De Vries, N. K. (1995a). Anticipated affective reactions and prevention of AIDS. *British Journal of Social Psychology*, 34, 9-21.
- Richard, R., Van der Pligt, J., & De Vries, N. K. (1995b). *Anticipated worry and regret and sexual risk-taking behavior*. Manuscript submitted for publication.
- Salancik, G. R. (1982). Attitude-behavior consistencies as social logics. In M. P. Zanna, E. T. Higgins & C. P. Herman (Eds.), *Consistency in social behavior: The Ontario symposium* (Vol. 2., pp. 51-73). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Salancik, G. R., & Conway, M. (1975). Attitude inferences from salient and relevant cognitive content about behavior. *Journal of Personality and Social Psychology*, 32, 829-840.
- Schaalma, H., Kok, G., & Peters, L. (1993). Determinants of consistent condom use by adolescents: The impact of experience of sexual intercourse. *Health Education Research*, 8, 255-269.
- Schifter, D. B., & Ajzen, I. (1985). Intention, perceived control, and weight loss: An application of the theory of planned behavior. *Journal of Personality and Social Psychology*, 49, 843-851.
- Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of Consumer Research*, 15, 325-343.
- Simonson, I. (1989). Choice based on reasons: The case of attraction and compromise effects. *Journal of Consumer Research*, 16, 158-174.
- Sparks, P., Hedderley, D., & Shepherd, R. (1992). An investigation into the relationship between perceived control, attitude variability and the consumption of two common foods. *European Journal of Social Psychology*, 22, 55-71.
- Sutton, S., Marsh, A., & Matheson, J. (1990). Microanalysis of smokers' beliefs about the consequences of quitting: Results from a large population sample. *Journal of Applied Social Psychology*, 20, 1847-1862.
- Warshaw, P. R., & Davis, F. D. (1985a). The accuracy of behavioral intention versus behavioral expectation for predicting behavioral goals. *Journal of Psychology*, 119, 599-602.
- Warshaw, P. R., & Davis, F. D. (1985b). Disentangling behavioral intentions and behavioral expectations. *Journal of Experimental Social Psychology*, 21, 213-228.
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35, 151-175.
- Zanna, M. P., & Rempel, J. K. (1988). Attitudes: a new look at an old concept. In D. Bar-Tal & A. Kruglanski (Eds.), *The social psychology of knowledge* (pp. 315-334). New York: Cambridge University Press.