

Belief, Affect, and Attitude: Alternative Models of the Determinants of Attitude

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A recent debate in the *Journal of Consumer Psychology* illustrates many of the unresolved issues concerning the development and application of models to predict attitude. A central issue in the debate is whether a noncognitive factor, such as affect, may exert a direct influence on attitude, or whether its influence is mediated by the cognitive structure. We describe the results of two studies designed to determine (a) whether affect and attitude are separate constructs and (b) whether affect influences attitude independently of cognitive structure. The studies address the methodological criticisms levied against previous research and provide results to indicate that affect does influence attitudes directly and independently of cognitive structure.

Attitude researchers focus on the explication and development of models that can parsimoniously explain how people evaluate and respond to various stimuli. Common to many perspectives on attitude research is an emphasis on understanding the relations between cognitive structure (i.e., beliefs), affect, and attitude. There is disagreement, however, among the models purported to reflect the relations among these constructs. For instance, some theorists have argued for the centrality of beliefs, which they contend mediate the effects of affect on attitude, and other theorists have suggested that affect has a direct effect in determining attitudes beyond the effect of cognition.

These different perspectives are encapsulated in a recent series of articles published in the *Journal of Consumer Psychology*. The debate, as yet unresolved, is whether attitudes may be influenced by noncognitive factors, such as affect, in consequential and measurable ways. Fishbein and Middlestadt (1995, 1997) argued that when the cognitive structure derived from the Theory of Reasoned Action is used to predict attitude, noncognitive factors “will explain little, if any, variance in the criterion [attitude]” (Fishbein & Middlestadt, 1995, p. 184). Other authors have argued that noncognitive factors, such as affect, have a significant influence on attitude that is not mediated by the cognitive structure (e.g., Breckler, 1984; Crites, Fabrigar, & Petty, 1994; Haugtvedt, 1997; Herr, 1995; Miniard & Barone,

1997; Schwarz, 1997). In this article, we explore (a) whether there is evidence for the discriminant and nomological validity of attitude and affect and (b) whether affect has a direct effect on attitude. Our findings are considered in terms of their implications for attitude theory and the application of theory to social issues.

TWO PERSPECTIVES ON THE DETERMINANTS OF ATTITUDE

Fishbein and Ajzen (1975) advocated one perspective on the determinants of attitude. In their view, cognitive structure, based on a person’s salient beliefs and the use of an expectancy-value model, determines a person’s attitude. This cognitive structure is proposed to mediate the influence of other factors (such as affect) on attitude. When assessing the cognitions that determine an attitude, Ajzen and Fishbein (1980) emphasized the importance of eliciting beliefs that correspond with the attitude in terms of the time frame, target, action, and context, because a lack of correspondence may attenuate the relations between beliefs, attitude, intention, and behavior.

Although Ajzen and Fishbein (1980) emphasized the centrality of cognitions as determinants of attitude, several researchers demonstrate the impact of affect on attitude. Holbrook and Batra (1987) found that multiple affect categories are related to attitudes. Trafimow and Sheeran (1998) found differences between affective- and cognitive-based beliefs and observed associations of each type of belief with attitudes. In addition, Eagly, Mladinic, and Otto

(1994) used an idiographic rather than a nomothetic approach to measure beliefs and affect. They found that both cognitive structure and affect predict attitude. These results suggest that cognitions may not always be central determinants of attitude, and they indicate the need for further systematic, rigorous examination of the relations between the constructs believed to influence attitudes.

Two different views of the determinants of attitude are presented in Figure 1. The model in Panel A reflects a perspective in which the influence of affect on attitude is mediated by the cognitive structure. In Panel B, attitude is determined both by cognitive structure and by a direct and an indirect effect of affect.

In addition to the issue of determining the more appropriate model, concerns about the appropriate measurement level for assessing cognitive structure may influence the credibility of any attempt to differentiate between conceptual models. To illustrate the issue, an idiographic approach to assessing attitudes is often assumed to provide a more precise measure of an individual's salient beliefs. One unresolved issue from the research of Eagly et al. (1994) is whether significant differences exist in the ability of cognitive structure to predict attitude when an idiographic or a nomothetic approach is used.

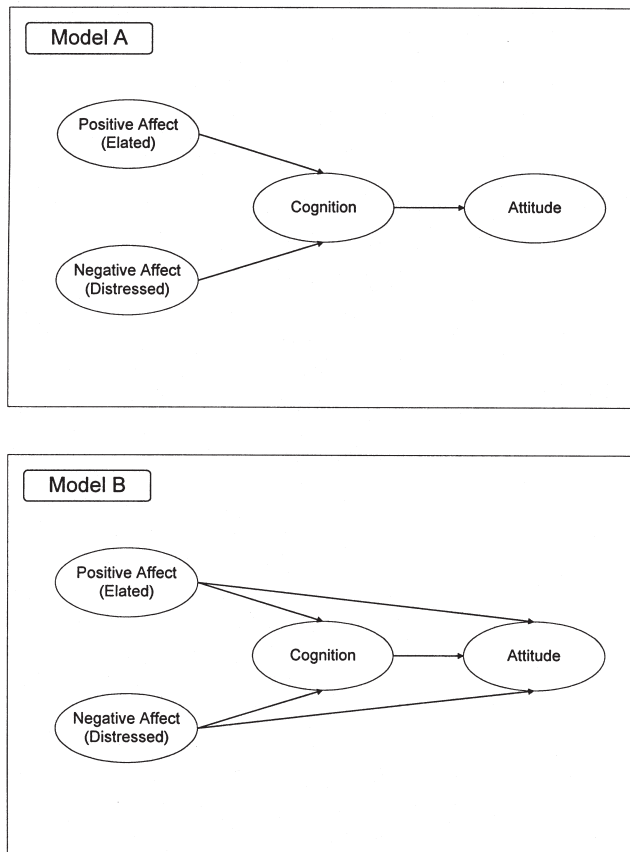


FIGURE 1 Alternative models of attitude formation. Model A is a single path model. Model B is an independent influence model.

We report the results of two studies that provide empirical evaluations of the two models in Figure 1. In Study 1, we address several methodological issues (such as order of presentation effects, level of measurement effects, appropriate representation of the cognitive structure) that may influence the relations among cognition, affect, and attitude. We also present an empirical comparison of the two models presented in Figure 1. In Study 2, we extend our assessment of whether cognitive structure mediates the effect of affect on attitude, or whether affect has a direct effect on attitude.

STUDY 1

Overview

Our goal in Study 1 was threefold: (a) to investigate whether the order of presentation of cognitive structure, attitude, and affect measures influences the observed relations among these measures (Schwarz, 1997); (b) to contrast the relation between an idiographic and a nomothetic measurement of cognitive structure with attitude (Eagly et al., 1994); and (c) to compare the two alternative attitude models presented in Figure 1. Data were collected from respondents about beliefs, affect, and attitude for three HIV prevention and detection behaviors: obtaining a blood test, abstaining from sex, and always using latex condoms. We selected these behaviors because of their relevance to our participant population—college students. AIDS, from HIV infection, is the leading cause of death among 25- to 44-year-olds, accounting for 19% of deaths in this age group (U.S. Department of Health and Human Services, Public Health Service, 1997). The majority of the newly infected adults internationally are between 15 and 24 years of age, and 25% of new HIV infections annually in the United States occur among people under age 21 (The White House, 1997).

Procedures

Data were collected in two sessions from 95 respondents. In Session 1, we elicited from each individual the salient beliefs for each behavior. In Session 2, 3 to 5 days after Session 1, we asked each individual to respond to measures that represented his or her beliefs identified in Session 1, affect, attitude, and a set of modal salient beliefs identified across all respondents who participated in Session 1. Respondents were told that their answers were anonymous and confidential and that two people would be selected at random to receive prizes of \$50 or \$25.

Measuring Beliefs, Affect, and Attitude

Salient beliefs. Fishbein and Ajzen (1975) stated that the initial step in operationalizing cognitive structure is to identify the salient beliefs associated with performing the tar-

get behaviors. We asked the respondents to list the advantages and disadvantages of performing the behavior, as well as any other outcomes or attributes that they associated with performing the behavior. Specifically, we asked respondents two open-ended questions: "We are interested in finding out what you see as the advantages, if any, and disadvantages, if any, of abstaining from sex. Please be specific," and "Is there anything else you associate with abstaining from sex?" (Ajzen & Fishbein, 1980, p. 262). In addition to identifying these idiographic beliefs, we specified a set of modal salient beliefs by selecting those beliefs that were mentioned by at least 10% of the respondents (Fishbein & Middlestadt, 1995). This nomothetic approach resulted in 10 salient beliefs for obtaining a blood test, 8 salient beliefs for abstaining from sex, and 10 salient beliefs for always using a latex condom. Two separate measures of cognitive structure were derived using the expectancy-value formulation, one based on the idiographically derived salient beliefs and the other based on the nomothetically derived modal salient beliefs.

Beliefs and evaluations. We measured beliefs with a 7-point bipolar scale, ranging from 1 (*extremely unlikely*) to 7 (*extremely likely*), following the standard procedures advocated by Ajzen and Fishbein (1980). The evaluative aspect of each belief was measured with a 7-point bipolar scale, ranging from 1 (*extremely bad*) to 7 (*extremely good*), following standard measurement procedures suggested by Ajzen and Fishbein. The measures of beliefs were designed to correspond with attitude in terms of behavior, target, time, and context. All measures in our study refer to a specific behavior, a specific target, a general timeframe, and a general context.

Attitude. Participants were asked to report their attitudes toward performing each behavior on three 7-point semantic differential items: *good/bad*, *pleasant/unpleasant*, and *favorable/unfavorable*. These adjective pairs are used widely in research as indicators of attitude (e.g., Allen & Janiszewski, 1989).

Affect. Several authors (e.g., Mano, 1991; Russell, 1980; Watson & Tellegen, 1985) have posited a two-dimensional structure for affect that reflects a pleasure/pleasantness (valenced) dimension and an arousal (intensity) dimension. Within this dimensional structure, multiple categories of affect have been proposed. For example, Mano proposed eight categories of affect: aroused, elated, pleased, calm, quiet, bored, unpleasant, and distressed, and he provided evidence for the convergence of a circumplex structure under different contexts (i.e., naturally occurring and induced affect) and under different methodologies (i.e., dimensionality and classification). Watson and Tellegen also proposed a two-dimensional structure of affect—positive affect and negative affect. These dimensions reflect a 45° rota-

tion of the dimensional structure proposed by Mano and are consistent with the previous two-dimensional structure of valence and arousal.

We measured affect by focusing on those categories from past research that reflect some level of arousal and that have been used in past research on affect and attitude (e.g., Batra & Holbrook, 1990; Burke & Edell, 1989). Our items represented four affect categories based on Mano's (1991) work: (a) *arousal* (aroused, astonished, surprised), (b) *elation* (elated, active, excited), (c) *pleasantness* (pleased, satisfied, happy), and (d) *distress* (anxious, fearful, nervous). Respondents were asked to express how they felt about each behavior on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*).

Potential Order Effects

Several researchers (e.g., Feldman & Lynch, 1988; Schwarz, 1997) have suggested that the order in which the measures of affect, cognition, and attitude are presented may influence the cognition-attitude and affect-attitude relations. The behaviors used in our study—HIV-related behaviors and drinking and driving—are relevant to our sample, and respondents are likely to have substantial information available to them in memory about these behaviors. Sudman, Bradburn, and Schwarz (1996) argued that when respondents are asked specific questions that rely on relevant information accessible in memory, context (or order) effects "will be small or may vanish completely" (p. 160).

We created the following three orders of assessment to determine if item order influences the observed correlations: (a) cognition, affect, attitude; (b) attitude, cognition, affect; and (c) affect, attitude, cognition. In all cases, the measures of affect, attitude, and cognition were separated by distractor tasks composed of personality scales (e.g., need for cognition, self-esteem, self-monitoring). We assessed the nomothetic-level beliefs after the presentation of idiographic-level cognition, affect, and attitude to prevent a possible confound caused by responding to aggregate-level beliefs prior to responding to the idiographic beliefs and attitude.

Results

We addressed two questions in our analyses: First, is there a difference in the strength of the relation between cognitive structure ($\Sigma b_i c_i$) and attitude, and between affect and attitude for different orders of presentation? Second, does an idiographic measure of cognitive structure predict attitude better than a nomothetic measure of cognitive structure?

Preliminary Analyses

Overall, there were fewer than 5% missing data for any given closed format measure of beliefs, affect, and atti-

tudes. Missing values were imputed using a maximum likelihood estimation method of Little and Rubin (Jaccard & Wan, 1996). We examined the response distributions of all measures and found that the skewness and kurtosis values were consistently less than an absolute value of 2, suggesting that any nonnormality that is present is not likely to be problematic for the analyses that we performed (Jaccard & Wan, 1996).

Analysis of Order Effects

We used regression analysis to examine whether the order of the cognition, affect, and attitude measures influenced the cognition–attitude and affect–attitude relations. We created a model in which attitude was the criterion, and cognitive structure, dummy codes for order effects, and Cognitive Structure \times Order interaction terms were the predictors (Jaccard, Turrisi, & Wan, 1991). Contrasts were defined in the regression analyses to examine slope differences for attitudes and cognitions as a function of the pairwise comparisons of the three order effects. We repeated this analysis using affect, rather than cognition, as the primary independent variable, and we focused on two measures of affect (elated and distressed).¹ For each behavior, we contrasted the cognitive–attitude, elated–attitude, and distressed–attitude relation for all possible order pairs (i.e., Order 1–2, Order 1–3, and Order 2–3). There were 9 contrasts for each behavior and 27 contrasts across the three behaviors. Only 2 of these contrasts were significant between .05 and .10. The other 25 contrasts were significant at $p > .10$, with a median p value of .45. All of the interaction coefficients indicate minimal effects for order.

Idiographic and Nomothetic Measurement of Cognitive Structure

We examined the correlations between the idiographic- and nomothetic-level measurement of cognitive structure and attitude for each behavior. All correlations were significantly greater than zero ($p < .05$), indicating a significant relation between cognitive structure and attitude. We observed no statistically significant differences between the idiographic-level, cognitive structure–attitude and nomothetic-level, cognitive structure–attitude correlations (see Table 1). The mean number of salient beliefs at the idiographic level (3.77, 4.34, 3.19 for each behavior, respectively) was lower than the number of beliefs selected using Fishbein and Ajzen's (1975) modal salient belief procedures. We recalculated a nomothetic-based index using the four most frequently mentioned beliefs and correlated this index with attitude. Based on a Fisher r - z transformation, the resulting correlations were not significantly different than the correlations of the idiographic-level

cognitive structure or the nomothetic-level cognitive structure (based on the larger set of beliefs) and attitude. These findings suggest that the idiographic–cognitive structure is not a significantly better predictor of attitude than the nomothetic-based index of cognitive structure and that the four most frequently mentioned beliefs at the aggregate level provide an adequate representation of the cognitive structure.

We compared the two alternative models shown in Figure 1 using a structural equation approach, and we conducted three sets of analyses. One set of analyses used the idiographic-based measure of cognitive structure, the second set of analyses used the nomothetic-based measure of cognitive structure (using all beliefs), and the third set of analyses used a modified nomothetic-based measure of cognitive structure (using the four most frequently mentioned beliefs). In all three sets of analyses, Model B provided a significantly better fit to the data than Model A, based on a chi-square difference test ($p < .05$) for obtaining a blood test and abstaining from sex. For both of these behaviors, the coefficient for the direct path between affect and attitude was significant ($p < .01$), as was the direct path between cognitive structure and attitude.² For the behavior of always using a condom, the chi-square difference test was not significant, indicating that affect did not have a significant direct effect on attitude.

In sum, we found that order of presentation did not influence the cognitive structure–attitude or the affect–attitude correlations. We also found that the correlation between a nomothetic assessment of cognitive structure (using the four most frequently mentioned beliefs) and attitude was not significantly different than the correlation between the idiographic measure of cognitive structure or the nomothetic assessment of cognitive structure (using all those beliefs mentioned by at least 10% of the sample) and attitude. Finally, we found support for two of the three HIV-related behaviors that Model B (direct effect of affect on attitude) provided a significantly better fit to the data than Model A (the effect of affect is mediated by cognitive structure). In the following study, we provide a more extensive comparison of the mediated effect and direct effect models.

STUDY 2

Overview

We conducted Study 2 to evaluate whether affect contributes to the prediction of attitude beyond the direct effect of cogni-

¹The justification for using these two affect categories is presented in our analysis of the data from Study 2.

²The chi-square difference values were 6.52, 8.93, and 8.69 ($df = 3$) for idiographic, nomothetic (four beliefs), and nomothetic (all beliefs) measures of cognitive structure and obtaining a blood test. For abstaining from sex, the chi-square difference values were 10.33, 7.57, and 12.72 ($df = 3, 2, 2$, respectively) for idiographic, nomothetic (four beliefs), and nomothetic (all beliefs) measures of cognitive structure.

TABLE 1
Cognition–Attitude Correlations

Behavior	Cognitive Structure ^a	Attitude	95% CI	
			Lower Limit	Upper Limit
Obtaining a blood test	Nomothetic	0.192**	–0.010	0.379
	Reduced-nomothetic	0.283*	0.086	0.458
	Idiographic	0.198**	–0.004	0.384
Abstaining from sex	Nomothetic	0.501*	0.333	0.638
	Reduced-nomothetic	0.395*	0.210	0.553
	Idiographic	0.489*	0.319	0.629
Always using condoms	Nomothetic	0.412*	0.230	0.567
	Reduced-nomothetic	0.489*	0.319	0.629
	Idiographic	0.393*	0.208	0.551

Note. CI = confidence interval.

^a*N* = 95.

p* < .01, two-tailed. *p* < .10, two-tailed.

tive structure on attitude. We extended the number of HIV prevention behaviors, and we included behaviors related to a second relevant social issue, drunk driving, to assess the robustness of our model comparisons.

Social Issues

This study focused on nine behaviors for two separate social issues: the prevention and detection of HIV and AIDS, and the prevention of drunk driving. Numerous researchers have used college students as the target population because of the social costs associated with HIV and drunk driving and the relevance of these two issues to college students (e.g., Lastovicka, Murray, Joachimsthaler, Bhalla, & Scheurich, 1987; Nucifora, Gallois, & Kashima, 1993).

Detection and Prevention of HIV and AIDS

Several behaviors concerning the detection and prevention of HIV and AIDS have been examined in previous research. We have included each of the following behaviors in this study because of their effectiveness in detecting and preventing HIV and their wide coverage in literature: (a) obtaining blood tests (Kalichman & Coley, 1995), (b) using condoms (Nucifora et al., 1993; Richard, van der Pligt, & de Vries, 1995), (c) talking with your partner (Fishbein et al., 1995; Kalichman & Coley, 1995), (d) having multiple or fewer partners (Cochrane, Mays, Ciarletta, Caruso, & Mallon, 1992), and (e) abstaining from sex (Richard et al., 1995).

Prevention of Drinking and Driving

According to National Highway Traffic Safety Administration estimates, alcohol was involved in 41% of fatal crashes and in 7% of all crashes in 1995. Of the alcohol-related fatal crashes, 28% involved drivers between 21

and 24 years of age, and 27% involved drivers between 25 and 34 years of age (National Highway Traffic Safety Administration, 1997). Although mass media campaigns appear to be effective in decreasing self-reports of drinking and driving behavior among the youth (Murry, Stam, & Lastovicka, 1993), the decrease in drunk driving for 21- to 34-year-old drivers in the past decade is still low (Prince, 1995). Numerous researchers have examined several behaviors to reduce the incidence of drinking and driving (Lastovicka et al., 1987; Parker, Manstead, & Baxter, 1992; Turrissi, Jaccard, Kelly, & Valera, 1994). We focus on those behaviors used in this past research: (a) avoiding drunk driving, (b) specifying a designated driver, (c) asking for a ride or calling someone, and (d) refraining from alcohol if you plan on driving.

Participants

Data collection was integrated into a class project in an upper-level consumer behavior class. There were 101 student experimenters who collected data from 384 undergraduate students. A total of 199 students responded to the drunk driving study, and 185 participants responded to the HIV study. The respondents in our study ranged from 18 to 37 years of age, with a mean age of 21 years.

Procedures

The student experimenters were divided into 20 groups with approximately four to five students in each group. Ten groups participated in the detection and prevention of HIV and AIDS, and 10 groups participated in the prevention of drinking and driving. Each group was instructed to obtain 20 respondents.

All respondents were instructed to return their completed surveys in sealed envelopes to reduce privacy concerns. The name of each respondent was placed in a separate envelope

and was not attached to the completed survey to ensure confidentiality and anonymity. Respondents were informed that three people would be selected at random to receive a prize of \$100, \$50, or \$25.

We assessed whether differences existed for the measures of cognitive structure (i.e., $\Sigma b_i e_i$), attitudes, and affect between the 10 “experimenter” groups for each social issue. We conducted a multivariate analysis of variance (MANOVA) for each of the key variables across the five (HIV) and four (drinking and driving) prevention and detection behaviors. The MANOVA results for each behavior showed no significant differences ($p < .01$) among the 10 groups for each variable (i.e., affect, attitude, intention, and cognitive structure). We aggregated the data sets collected by the 10 groups within each social issue for subsequent analysis because we found no systematic differences between data sets from the experimenter groups.

Measuring Beliefs, Affect, and Intention

Salient beliefs. We identified the salient beliefs associated with performing each of the nine target behaviors by asking 53 students from the same target population as the main study to list the advantages and disadvantages of performing each behavior. Of this sample, 25 people responded to the five HIV-related behaviors and 28 people responded to the four drinking-and-driving-related behaviors. We used the four most frequently mentioned beliefs to represent the salient beliefs for each behavior.³ The Appendix contains the salient beliefs used in Study 2.

Beliefs, evaluations, attitude, and intention. We measured beliefs, evaluations, and attitudes (and intentions) by using a 7-point bipolar scale, as described in Study 1. We used the same 12 items to represent the four affect categories as in Study 1 by using a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). The order of presentation used to measure these constructs was beliefs, evaluations, affect, attitude, and intention.

Results

Preliminary Analyses

Overall, fewer than 3% of the variables of interest in both data sets contained missing values. We replaced missing val-

ues in both the drinking and driving and HIV data sets by using a maximum likelihood estimation method, and we found that the skewness and kurtosis values were consistently below 2. We address two questions in our subsequent analyses: Are the constructs of affect and attitude discriminable, and do cognitive and affective factors influence attitude independently?

Discriminant Validity of Affect and Attitude Measures

Two criteria were used to address whether affect and attitude are discriminable (cf. Calder, Phillips, & Tybout, 1981; Lynch, 1982). First, we assessed whether the measures of these two constructs exhibit *trait validity*—that is, are the measures of these two constructs distinct? This particular question is relevant to this research because one research tradition has defined affect and attitude as the same construct (Fishbein & Ajzen, 1975), whereas a second research tradition has treated the constructs as distinct (e.g., Cohen & Areni, 1991). The second criterion for assessing the discriminant validity of affect and attitude is whether the constructs differ in their *nomological relations*—that is, do the constructs of attitude and affect each make a significant and independent contribution in predicting a third variable, intention?

Trait validity. We first tested a model in which the measures of affect and attitude were treated as a single factor to determine whether affect and attitude reflect a single construct. The chi-square value was significant (with a median value of 860; $df = 90$), and the goodness-of-fit indices all indicated poor model fit. The Goodness-of-Fit Index (GFI) and Comparative Fit Index (CFI) ranged from .455 to .613 and .383 to .519, respectively (with a median value of .557 and .470, respectively). We then conducted a confirmatory factor analysis using the three indicators for each of the four affect categories and the three indicators of attitude. Figure 2 contains the measurement model. This analysis was repeated for the five HIV-related behaviors and the four drinking-and-driving-related behaviors. The hypothesized model (i.e., the four affect categories and attitude) did not provide an adequate fit to the data. The chi-square value was significant for all nine models and ranged from 197 to 302 (with a median value of 254; $df = 80$). The GFI and CFI ranged from .845 to .871 and .848 to .915, respectively (with a median value of .857 and .863, respectively).

We examined the zero-order correlations among the indicators for each affect category and for attitude. We also reviewed the modification index for each indicator. The same two indicators—arousal and active—added significant stress to the model for each of the nine behaviors and were not correlated in the same manner as the other two indicators for that affect category. We deleted these two indicators and repeated the confirmatory factor analysis. In addition, we deleted the scale Pleasant–Unpleasant as a measure of attitude for obtain-

³We recognize that behaviors in Study 2 (e.g., drinking and driving behaviors) not included in Study 1 may be influenced by the order of presentation and that the number of salient beliefs may be greater than four. Our findings from Study 1, however, concerning order effects and the number of beliefs, reduce the plausibility of order effects as an alternative methodological explanation and increase the plausibility that the four most frequently mentioned beliefs provide an adequate representation of cognitive structure.

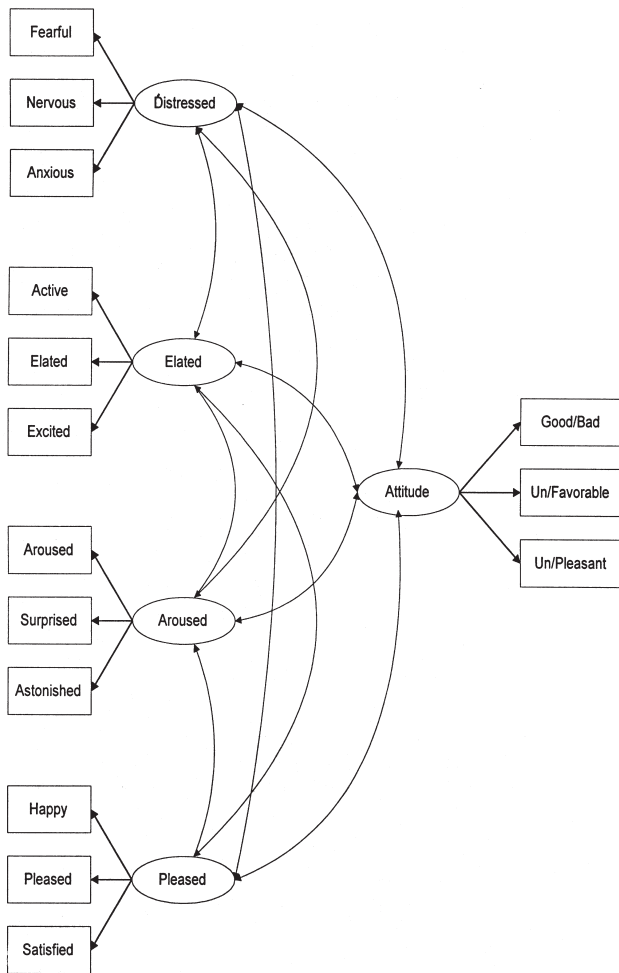


FIGURE 2 Confirmatory factor analysis model for affect and attitude.

ing a blood test because of its low correlation with the other two attitude scales (i.e., .21 and .33 with the Good–Bad and Favorable–Unfavorable scale, respectively) and its involvement in large modification indices within the model. All three indicators of attitude were used for the remaining eight behaviors.

The confirmatory analysis for this modified model (i.e., three indicators for the pleased and distressed affect categories, two indicators for the elated and aroused affect categories, and three indicators for the attitude construct) was conducted for each behavior. This revised model provided a significantly better fit to the data (based on a chi-square difference test) than the original model presented in Figure 2 and an adequate fit to the data based on the chi-square values, the GFI, CFI, and Root Mean Square Error of Approximation (RMSEA) for each of the nine behaviors. The chi-square values ranged from 86.9 to 186.5 (with a median value of 122.8; $df = 55$), the GFI and CFI ranged from .874

to .935 and .902 to .961, respectively (with a median value of .910 and .937, respectively). The RMSEA ranged from .056 to .110 (with a median value of .084). Although some of these fit indices were slightly outside the commonly accepted range for declaring “good fit” (e.g., 0.08), more detailed inspection of parameter specific fit indices and residuals suggested good model fit that could be improved slightly in any given run by freeing up an idiosyncratic parameter from one model to the next.

We selected two affect categories to test the proposed attitude models—elated and distressed—based on conceptual and empirical reasons. Conceptually, the two-dimensional affect structure (i.e., pleasantness and arousal) proposed by Mano (1991) reflects a 45° rotation of Watson and Tellegen’s (1985) PANAS scale. In the PANAS scale, “elated” and “distressed” represent “positive affectivity (PA)” and “negative affectivity (NA),” respectively (Mano, 1991; Mano & Oliver, 1993). These two affect categories—elated and distressed—also reflect the same level of arousal in the Mano circumplex. Empirically, we found that the latent constructs of elated and pleased were highly correlated in the confirmatory factor analysis (i.e., ranging from a .642 to a .825 correlation, with a median correlation of .773 across the nine behaviors). We also found that the latent constructs of aroused and distressed were highly correlated in the confirmatory analysis (i.e., ranging from a .296 to a .995 correlation, with a median correlation of .728 across the nine behaviors). These correlations among the latent variables introduce redundancy and instability in the structural equation analysis used for the model tests. Thus, we focused on two affect categories that reflect positive and negative affect and that are consistently uncorrelated (i.e., ranging from a $-.015$ to a .252 correlation, with a median correlation of .112 across the nine behaviors).

We repeated the confirmatory factor analysis for the model with the attitude, distressed, and elated latent constructs. This reduced model provided a significantly better goodness-of-fit (based on a chi-square difference test) than the revised model previously reported for all nine behaviors. The chi-square difference ranged from 42.5 to 107.5, with a median value of 71.1. Table 2 contains a summary of the fit statistics for the reduced model.

Nomological validity of affect and attitude measures. If affect and attitude are distinct constructs, then they should each make independent contributions to a third construct that is hypothesized to be influenced by each. Some researchers (e.g., Triandis, 1977) have proposed that both affect and attitude contribute to the prediction of intention. We evaluated the nomological validity of affect and attitude by assessing whether each construct accounts for unique variance in the prediction of intention. If these two constructs make independent contributions in predicting a third variable, then we will have evidence for the nomological validity of these two constructs.

TABLE 2
Confirmatory Factor Analysis

	<i>Social Issue: HIV</i>					<i>Social Issue: DD</i>			
	<i>Behaviors</i>					<i>Behaviors</i>			
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
χ^2	19.5	43.4	51.1	34.6	71.7	56.8	33.6	60.3	79.0
<i>df</i>	12 ^a	18	17	18 ^b	17	19	17	18	17
GFI	0.972	0.943	0.941	0.957	0.920	0.937	0.961	0.936	0.915
CFI	0.986	0.961	0.933	0.980	0.918	0.941	0.974	0.943	0.916
RMSEA	0.058	0.088	0.104	0.071	0.132	0.100	0.070	0.109	0.136
PCLOSE	0.342	0.033	0.004	0.156	0.000	0.004	0.157	0.001	0.000

Note. GFI = Goodness-of-Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

^aChi-square test is not significant at $p < .05$. ^bChi-square test is not significant at $p < .01$.

We used a structural equation modeling approach to determine whether intention is influenced by affect (i.e., distressed and elated) and attitude. For four of the five HIV-related behaviors and for three of the four drinking-and-driving-related behaviors, affect was a significant, independent predictor of intention. For eight of the nine behaviors, attitude was a significant, independent predictor of intention. Attitude was not a significant predictor for the behavior of avoiding drunk driving.

Based on both the confirmatory factor analyses and the structural equation analysis, we obtained strong evidence to support the position that affect and attitude are discriminable. We used these measures in subsequent analyses to assess the structural relations among affect, beliefs, and attitude.

Cognitive and Affective Determinants of Attitude

We evaluated two models that represent the proposed determinants of attitude (see Figure 1). We assumed some measurement error for the cognitive structure (i.e., 20% of the variance of the $\Sigma b_i e_i$ measure) in the model tests summarized in Table 3 by constraining the measurement residuals for this term to take on a value that equaled 20% of the total variability in $\Sigma b_i e_i$. We also conducted similar tests with the assumption of no measurement error or 30% measurement error. We varied the level of measurement error to assess the sensitivity of the parameter estimates to these levels of error. The substantive conclusions concerning the parameter estimates did not change with the varying levels of measurement error. Table 3 contains chi-square values for Model A (cognitive structure mediates the effect of affect on attitude) and for Model B (affect has a direct and indirect effect on attitude).

An examination of the parameter estimates indicate that positive affect (elated) and negative affect (distressed) consistently have a significant relation to attitude. The cognitive structure also has a significant relation to attitude. Table 3 contains a summary of the unstandardized coefficients and

significance levels for direct paths of cognition, distressed, and elated on attitude in Model B.

For each behavior, Model B provided a significantly better fit to the observed covariance structure than did Model A. The chi-square difference test was significant for all nine behaviors.⁴ Based on the various goodness-of-fit indices, Model B provided a good representation of the data (see Table 4).

The absolute goodness-of-fit for these models may be improved for each behavior by allowing specific indicators of affect or attitude to be correlated or by allowing the error terms associated with the affect measures to be correlated. We present only a single model comparison for each of the nine behaviors to provide a more robust analysis of the two conceptual models of interest rather than to generate alternative models for each of the nine behaviors.^{5,6}

⁴We conducted two separate structural equation analyses. In four of the nine analyses, we found a negative variance estimate for the error term associated with the elated indicator. For one drinking and driving behavior, we also found a negative variance estimate for the error term associated with the nervous indicator. One option for addressing these offending estimates is to fix the error variance to zero and assume perfect reliability for this indicator. An alternative approach is to eliminate the indicator from the analysis. We used both approaches in our model comparisons, and the substantive conclusions regarding the superiority of model two remains unchanged. For simplicity, we present the analysis that fixes the variance estimate to zero for the indicators previously mentioned.

⁵We did conduct analyses of each behavior to identify a better fitting model. In these analyses, Model B continued to provide a significantly better fit to the data than Model A.

⁶We also conducted a series of analyses for each behavior in which we used alternative forms of cognitive structure. In one set of analyses, we used each $b_i e_i$ product as an indicator of a latent construct of cognitive structure rather than $\Sigma b_i e_i$ as single indicator of cognitive structure. A second set of analyses used each $b_i e_i$ product as having a direct effect on attitude (i.e., not mediated by the latent construct of cognitive structure). A third set of analyses used each b_i as having a direct effect on attitude (i.e., not mediated by the latent construct of cognitive structure). In all of these analyses, the single indicator model provided a better fit to the data than the model that used alternative measures of cognitive structure.

TABLE 3
Comparison of Model A and Model B

Issue	Behavior	Chi-Square (df)		GFI		CFI		RMSEA		PCLOSE	
		Model A	Model B	Model A	Model B	Model A	Model B	Model A	Model B	Model A	Model B
HIV	1 ^a	25.3 (17)	21.0 (16) ^b	0.966	0.974	0.985	0.991	0.051	0.041	0.436	0.582
	2	92.9 (24)	54.6 (23) ^b	0.907	0.939	0.896	0.952	0.125	0.086	0.000	0.023
	3 ^a	60.3 (25) ^b	53.6 (22)	0.939	0.945	0.936	0.943	0.088	0.088	0.016	0.020
	4	74.4 (24)	39.5 (23) ^b	0.923	0.956	0.941	0.981	0.107	0.062	0.001	0.247
	5	95.0 (25) ^b	76.0 (22)	0.910	0.923	0.900	0.923	0.123	0.115	0.000	0.000
DD	1 ^a	72.6 (26) ^b	63.6 (24) ^b	0.929	0.937	0.929	0.939	0.095	0.091	0.003	0.008
	2	63.8 (24)	43.2 (22)	0.937	0.956	0.940	0.968	0.091	0.070	0.007	0.136
	3	81.6 (24)	64.5 (22)	0.924	0.939	0.924	0.944	0.110	0.099	0.000	0.003
	4	110.6 (25) ^b	82.3 (22)	0.900	0.921	0.886	0.920	0.131	0.118	0.000	0.000

Note. GFI = Goodness-of-Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; DD = drinking and driving.
^aChi-square difference test is significant at $p < .05$ for the two models; $p < .01$ otherwise. ^bModels with negative variance estimates. Negative variances are constrained to 0.

TABLE 4
Unstandardized Coefficients in Model B

Issue	Behavior	Cognition	Elated	Distressed
HIV	1	0.054 ^a	—	-0.163 ^c
	2	0.038 ^a	0.978 ^a	-0.537 ^a
	3	0.058 ^a	—	-0.284 ^b
	4	0.044 ^a	0.295 ^a	-0.935 ^a
	5	0.070 ^a	0.526 ^a	-0.506 ^a
DD	1	0.037 ^a	—	-0.259 ^a
	2	—	—	-0.483 ^a
	3	0.032 ^a	0.227 ^a	-0.472 ^a
	4	—	0.147 ^b	-0.556 ^a

Note. DD = drinking and driving.
^a|CR| > 2.617, $p < .01$. ^b|CR| > 1.980, $p < .05$. ^c|CR| > 1.658, $p < .10$.

Based on the results from the model tests and the parameter estimates, we conclude that affect has a direct effect on attitude as well as indirect effect mediated by the person’s cognitive structure. This finding provides empirical support for the position presented by Miniard and Barone (1997), Haugtvedt (1997), and others who have argued for the relevance of noncognitive factors in determining attitude.

DISCUSSION

Despite a long history of attitude research founded on the premise that attitudes are formed primarily as the result of cognitive learning processes and concomitant changes to beliefs, some researchers have argued that affective factors may also play a substantial role in attitude formation (cf. Cohen & Areni, 1991). Our data support the position that affect and attitude are separate constructs and that affect has a direct and significant effect on attitude, independent of cognitive structure. This study and its results address several previously unresolved conceptual and methodological issues about the antecedents of attitudes and about the nature of the causal paths by which these antecedents may influence people’s attitudes.

The separability of affect and attitude and the evidence of a direct effect of affect on attitude have implications for researchers and practitioners. For example, it is generally assumed that there will be consistency between the evaluation of an attitude object and the classes of attitudinal responses (Eagly & Chaiken, 1993). Several studies, however, reveal evaluative–cognitive inconsistencies. Our evidence that affect can directly influence attitude suggests that inconsistencies between attitudes and evaluative responses can be explained by the predominant influence of affective inputs in the process of attitude formation, in situations where evaluative–affective consistency is greater than evaluative–cognitive consistency.

On a practical note, recognizing and treating affect and attitude as separate constructs necessitates the development and use of techniques for inferring attitudes that are capable of capturing the characteristics of each construct and of reflecting their independent roles in the expression of attitudes in the form of evaluative responses. For instance, although it is likely that most people would express a belief that HIV detection behaviors are important, the affective aspect of getting a blood test may be evaluated less favorably, thus resulting in an evaluative–cognitive inconsistency that may be manifest

as an attitude-behavior inconsistency. Thus, practitioners may be able to influence the formation of desirable attitudes (e.g., toward safe-sex behaviors) and increase attitude-behavior consistency by emphasizing or deemphasizing the affective influence on an attitude and its expression.

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APPENDIX

Salient Beliefs

A. Behaviors about HIV/AIDS prevention and detection.

- I. Obtaining a blood test to determine whether I have the HIV.
 1. Obtaining a blood test to determine whether I have the HIV would increase my knowledge about my HIV status.
 2. Obtaining a blood test to determine whether I have the HIV would motivate me to take safety precautions in the future if I am HIV negative.
 3. Obtaining a blood test to determine whether I have the HIV would increase the difficulty of coping with the truth about my HIV status.
 4. Obtaining a blood test to determine whether I have the HIV would be a painful test.
- II. To abstain from sex.
 1. Abstaining from sex would eliminate my fear of getting STDs and worries of unexpected pregnancy.
 2. Abstaining from sex would eliminate my fear of contracting HIV.
 3. Abstaining from sex would cause problems with my partner in our relationship.
 4. Abstaining from sex would deprive me from the enjoyment and pleasure of sex.
- III. To talk with my partner(s) about his/her sexual history and HIV status.
 1. Talking with my partner(s) about his/her sexual history and HIV status would increase my knowledge about my partner.
 2. Talking with my partner(s) about his/her sexual history and HIV status would make me feel safer and would make me worry less.
 3. Talking with my partner(s) about his/her sexual history and HIV status would result in embarrassment and belittlement.
 4. Talking with my partner(s) about his/her sexual history and HIV status would not be worthwhile because he/she may not be honest.
- IV. To have fewer sexual partners.
 1. Having fewer sexual partner(s) would substantially reduce my risk of contracting HIV.

2. Having fewer sexual partner(s) would reduce my worries and make me feel safer.
3. Having fewer sexual partner(s) would reduce the enjoyment and pleasure I get from my sexual activities.
4. Having fewer sexual partner(s) would still make me worry about contracting HIV and other STDs.

- V. To use a condom when I have sexual intercourse.
 1. Using a condom during my sexual activities would reduce my risk of contracting HIV.
 2. Using a condom during my sexual activities would reduce my worries about contracting STDs and unexpected pregnancies.
 3. Using a condom during my sexual activities would reduce the amount of pleasure and enjoyment I get from sex.
 4. Using a condom during my sexual activities would result in a mood change and destroy the spontaneity in the relationship.

B. Behaviors about detection and prevention of *drinking & driving*.

- I. To avoid drunk driving.
 1. Avoiding drunk driving would save lives.
 2. Avoiding drunk driving would save me from legal worries related to drinking and driving.
 3. Avoiding drunk driving would increase transportation difficulties after alcohol consumption.
 4. Avoiding drunk driving would increase costs of transportation.
- II. To specify a designated driver if I plan on consuming alcohol.
 1. Specifying a designated driver if I plan on consuming alcohol would assure a safe ride home.
 2. Specifying a designated driver if I plan on consuming alcohol would relieve me of my worries.
 3. Specifying a designated driver if I plan on consuming alcohol would deprive the designated driver from possible enjoyment and fun.
 4. Specifying a designated driver if I plan on consuming alcohol would not guarantee that he/she will not drink.
- III. To refrain from alcohol if I plan on driving.
 1. Refraining from alcohol if I plan on driving would save lives.
 2. Refraining from alcohol if I plan on driving would eliminate negative legal consequences.
 3. Refraining from alcohol if I plan on driving would deprive me of having good time.
 4. Refraining from alcohol if I plan on driving would make me feel like an outcast.
- IV. To ask for a ride or call someone when I have had too much to drink.

1. Asking for a ride or calling someone when I have had too much to drink would assure a safe ride home.
2. Asking for a ride or calling someone when I have had too much to drink would provide the comfort of not driving.
3. Asking for a ride or calling someone when I have had too much to drink would create inconvenience for others.
4. Asking for a ride or calling someone when I have had too much to drink would make me feel obligated.