Some Tests of the Distinction between Cognitive and Affective Beliefs

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Five experiments tested the distinction between affective and cognitive beliefs. Experiments 1 and 2 employed a traditional factor analytic paradigm to show that affective and cognitive items loaded on separate dimensions and that these separate dimensions had different implications for other variables. Experiment 3 made use of a recall paradigm to show that when people have to make behavioral decisions, they associate affective beliefs to other affective ones, and cognitive beliefs to other cognitive ones. The results indicated that participants' recall protocols were clustered by belief type when they had previously been asked to make a behavioral decision, but not in various control conditions. Finally, Experiments 4–5 demonstrated that such clustering can be obtained with people's self-generated beliefs. Findings are interpreted in terms of a new account of the relationship between affective and cognitive beliefs—the "associative hypothesis." Implications of this hypothesis for future research are outlined. © 1998 Academic Press

Despite the intuitive appeal of a distinction between affective and cognitive determinants of attitudes, much early research failed to provide much support for it (e.g., Mann, 1959; Ostrom, 1969; Woodsmansee & Cook, 1967). However, due in part to advances in methodological and statistical techniques, more recent researchers have obtained some success. For example, one strategy has been to show that a combination of affect and cognition predicts global attitudes better

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than either component alone (Abelson, Kinder, Peters, & Fiske, 1982; Breckler & Wiggins, 1989; Pfister & Böhm, 1992). Another strategy has been to have people respond to “affective” or “cognitive” words, and then use factor analytic techniques to group the terms into the two categories. Showing that affective words load together and that cognitive words load together is taken as evidence that participants’ attitudes do, in fact, have an affective and cognitive component (Abelson et al., 1982; Breckler, 1984; Breckler & Wiggins, 1989; Crites, Fabrigar, & Petty, 1994). Sometimes multiple measures of affect and cognition are included (e.g., Breckler, 1984) and a multitrait-multimethod type of paradigm (Campbell & Fiske, 1959) is used to support the distinction. A third strategy has been to manipulate whether people focus on affect or cognition (e.g., by presenting affective or cognitive information) when forming their attitudes; people who focus on affect show greater affect-attitude (or affect-behavior) consistency while those who focus on cognition show greater cognition-attitude consistency (Crites et al., 1994; Millar & Tesser, 1986). In sum, a variety of research paradigms have resulted in findings that are consistent with the affect-cognition distinction. Our aim is to extend previous research on the discriminant validity of affect and cognition and to suggest further tests of the distinction between these determinants of attitudes.

**Affective and Cognitive Beliefs**

Consider that when people write down responses on a questionnaire, they are saying what they believe to be the case. In other words, whether the experimenter is interested in affect or cognition, it is beliefs about affect and/or cognition that questionnaires elicit from the participants. We assume that these affective and/or cognitive beliefs have an important role to play in determining attitudes.

To be sure, defining beliefs as being “affective” or “cognitive” is not without its problems. As Eagly, Mladinic, and Otto (1994) pointed out, even if it were possible to have pure affect, completely uncontaminated by cognition, or pure cognition, completely uncontaminated by affect, matters would not remain so for very long. They used the term synergistic relation to describe the fact that affect and cognition influence each other. Clearly then, given the synergy between affect and cognition, it seems clear that all beliefs must have some degree of affect and some degree of cognition. Nevertheless, it seems reasonable to assume that some beliefs are “more affective” and some are “more cognitive” (hereafter, we will simply refer to affective versus cognitive beliefs or, where easier, to affect versus cognition).

Suppose that a person has some affective and cognitive beliefs and has to make a decision regarding the attitude object. It should be easier to compare beliefs to each other if they are on the same dimension (e.g., affective with affective or cognitive with cognitive) than if they are on different dimensions (e.g., affective with cognitive). Consequently, people should be more likely to consider affective beliefs in relation to other affective beliefs than to consider them in relation to cognitive beliefs, and they should be more likely to consider cognitive beliefs in
relation to each other than to consider them in relation to affective beliefs. In terms of associations between beliefs, the implication is that more associations should be formed between affective and other affective beliefs, and between cognitive and other cognitive beliefs, than between affective and cognitive beliefs. Such processing seems advantageous in at least three ways. First, it is seems more sensible to compare beliefs with similar beliefs (e.g., affective with affective or cognitive with cognitive) than with other beliefs that are on a different dimension (e.g., affective with cognitive). Second, comparing affective beliefs with each other is likely to result in a general concept of “how I feel about performing the behavior” (i.e., an affect concept) and comparing cognitive beliefs with each other is likely to result in a general concept of “whether it is to my advantage or disadvantage to perform the behavior” (i.e., a cognition concept). Thus, a decision can be made on the basis of considering just these two concepts rather than having to consider a large set of beliefs that may align on different dimensions. Finally, once general affect and cognition concepts are formed, these can be saved for future use when a decision about the behavior has to be made again, thereby saving resources in the future (Potts, St. John, & Kirson, 1989; Trafimow & Duran, 1998; Trafimow & Fishbein, 1995). We will term this notion—that stronger associations are formed between affective and affective beliefs, and between cognitive and cognitive beliefs, than between affective and cognitive beliefs—the associative hypothesis. If the associative hypothesis is demonstrated to be true, a general distinction between the affective versus cognitive determinants of attitudes will be likewise supported.

There is another point about beliefs that needs to be made. In most of the literature, researchers have been concerned with attitudes towards things such as animals, objects, groups of people, or even policy issues (e.g., abortion). But as Fishbein (c.f., 1980) has repeatedly pointed out, people do not need to make decisions about things, but about their behaviors pertaining to them. For example, it is not necessary to decide whether to have a globally positive or negative attitude towards pizza; rather, it is necessary to decide whether to actually eat one. Interestingly, despite all of the interest in affect versus cognition, with the exception of Breckler and Wiggins (1989), nobody we are aware of has explicitly explored this distinction in the context of attitudes towards behaviors rather than attitudes towards things. If, as Fiske (1992) has argued, “thinking is for doing” (p. 877), then this is a serious limitation of theory in the area. Therefore, one goal of the present research is to test affective and cognitive beliefs towards behaviors rather than things.

In pursuit of these aims, we performed five experiments. Experiment 1 tested the discriminant validity of affective versus cognitive beliefs using a variety of variables. Experiment 2 demonstrated the effects of affective and cognitive beliefs on actual prospective behavior. Experiments 3–5 explored specific implications of the associative hypothesis. Specifically, Experiment 3, using beliefs provided by the experimenter, demonstrated that people really do form more associations between beliefs of a similar type (e.g., affective with affective or cognitive with
cognitive) than between beliefs of different types (e.g., affective with cognitive). Further experiments result in similar findings even when participants process beliefs that they generate themselves (Experiment 4) and when participants themselves (rather than the experimenter) code the beliefs they write down as being affective or cognitive (Experiment 5).

EXPERIMENT 1

The purpose of the present experiment was to demonstrate the discriminant validity of semantic differential measures of affective and cognitive beliefs about a behavior (as opposed to an object). Smoking cigarettes was the behavior chosen because of its public health importance (Doll & Peto, 1981; Surgeon General, 1988) and because attitudes towards smoking are known to reliably predict both smoking intentions and behaviors (Fishbein, 1982; Kiesges, Cigrang, & Glasgow, 1987). Evidence also suggests that smokers are aware of the serious health consequences of their behavior but that they find smoking cigarettes extremely enjoyable (Chassin, Presson, Sherman, & Edwards, 1991; Murray, Swan, Johnson, & Bewley, 1983). Thus, we anticipated a divergence between affect and cognition toward smoking cigarettes among smokers.

Semantic differential measures of affective and cognitive beliefs were examined for two reasons. First, Crites et al.'s (1994) research demonstrated that good convergent and discriminant validity can be obtained for semantic differential measures of cognitive and affective beliefs towards several objects (things) and we wanted to extend this approach to attitudes towards behaviors. Second, semantic differential rating scales are the most commonly used "direct" measures of attitude in tests of the theory of reasoned action and the theory of planned behavior (Ajzen & Fishbein, 1980; Ajzen, 1988). The semantic differential scales employed in these studies usually possess cognitive (e.g., wise/foolish) and affective (e.g., pleasant/unpleasant) content, which are frequently summed or averaged to compute an overall attitude score. We would argue that if the discriminant validity of the affective and cognitive items can be demonstrated then they should properly be desegregated and treated as independent predictors in future research.

The discriminant validity of affective versus evaluative beliefs could be demonstrated in at least seven ways. Breckler and Wiggins' (1989) study of blood donation showed (1) that cognition and affect differ as a function of experience with blood donation and (2) that these variables were independently correlated with a measure of global attitude. However, their data failed to show (3) that correlations between cognition and global attitude and between affect and global attitude differed significantly as a function of experience or (4) that correlations between cognition and affect differed significantly as a function of experience. Importantly, it has not been demonstrated (5) that factor analysis supports the distinction between cognitive and affective items in the context of beliefs about a behavior. Nor has it been demonstrated (6) that cognition and affect have different associations with other variables within the same group of participants or (7) that
cognition or affect significantly predicts behavioral intentions over and above global attitude. Experiment 1 was designed to provide evidence for the discriminant validity of affective versus cognitive beliefs about smoking in these seven ways.

Method

Participants

Participants were 105 introductory psychology students at a UK university who voluntarily completed a questionnaire at the beginning of a laboratory class.

Measures

Cognition, affect, and global attitude. Crits et al.’s (1994) research was used to guide the construction of semantic differential measures of cognition, affect, and global attitude. For both the cognition and affect measures, participants responded to the stem “My smoking cigarettes (would) be...” using 7-point unweighted bipolar scales. The word pairs used to represent cognitions of the behavior were “harmful/beneficial,” “safe/unsafe,” “useful/useless,” “healthy/unhealthy,” and “wise/foolish.” The word pairs used to represent affect towards the behavior were “pleasant/unpleasant,” “nice/nasty,” “enjoyable/not enjoyable,” “gratifying/evicting,” and “satisfying/unsatisfying.” To reduce shared method variance, 9-point scales numbered −4 to +4 with 0 as a midpoint were used as response options for global attitudes toward smoking. Participants responded to the stem “Overall, my attitude towards my smoking is...” Three pairs of very general judgmental terms that did not describe affective states or traits associated with a behavior were used to measure global attitude (“positive/negative,” “pro/anti,” and “favorable/unfavorable”).

Other measures. Participants’ intentions to smoke cigarettes in the future were measured using a single item bipolar scale (“I intend smoking cigarettes in the future/I do not intend smoking cigarettes in the future”). Participants were also asked if “you currently smoke cigarettes?” (yes/no), “About how many cigarettes do you smoke per day?”, “For how long have you smoked cigarettes?” “Did you smoke cigarettes in the past but have now given up?”, “Have you ever tried to give up smoking?”, “Do you intend trying to give up smoking?”, and if so “How soon do you intend trying to give up?”

Eagly et al. have criticized other measures of affect and cognition on the grounds that the items used to assess these constructs (a) may not unambiguously represent cognitive versus affective information and (b) may not be equal in their global positivity or negativity. To address these potential criticisms, we asked a separate group of students (N = 10) from the same introductory psychology class as those who participated in the main experiment to perform two tasks. First, these participants were asked to decide whether the content of each of the words used in the bipolar scales measuring affect and cognition was either cognitive or affective in their view. All participants correctly identified the words as representing cognition or affect in line with our predictions, with one exception. Thirty percent of participants characterized the term “useless” as affective rather than cognitive. Because this item (“useful/useless”) could not be considered to unambiguously represent an affective item, we dropped it from the analyses to be reported.

The second task examined the global positivity or negativity of affect and cognition items. Participants were given the instructions “Supposing you were told a behavior was (“healthy,” “unpleasant,” etc.), how good or bad would that be?” They rated each word on a 7-point “good/bad” scale. No significant differences in participants’ ratings were obtained (p > .1). Although these analyses are, admittedly, post hoc, they suggest that the findings to be presented cannot be attributed to differences in the global positivity or negativity of the bipolar scales used to measure cognition and affect.
BELIEFS

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyable</td>
<td>.96</td>
<td>-.02</td>
</tr>
<tr>
<td>Satisfying</td>
<td>.93</td>
<td>-.10</td>
</tr>
<tr>
<td>Gratifying</td>
<td>.93</td>
<td>-.00</td>
</tr>
<tr>
<td>Nice</td>
<td>.87</td>
<td>.12</td>
</tr>
<tr>
<td>Pleasant</td>
<td>.86</td>
<td>.10</td>
</tr>
<tr>
<td>Harmful</td>
<td>-.09</td>
<td>.87</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>-.03</td>
<td>.86</td>
</tr>
<tr>
<td>Wise</td>
<td>.09</td>
<td>.76</td>
</tr>
<tr>
<td>Safe</td>
<td>.10</td>
<td>.67</td>
</tr>
</tbody>
</table>

Results

There were 37 smokers and 68 nonsmokers in the sample. Smokers consumed an average of 7.47 cigarettes per day ($SD = 5.48$) and had been smoking for an average of 3$\frac{1}{2}$ years ($M = 44.73$ months, $SD = 32.99$).

Factor Analysis and Construction of Scales

Exploratory factor analysis was first used to determine the discriminant and convergent validity of the cognitive and affective beliefs. We used an iterative principal axis factor extraction method with an oblique rotation (SPSS “oblimin” command) because we suspected that the factors might be correlated above $r = .30$ (Tabachnik & Fidell, 1989). Two factors accounting for 75.7% of item variance were obtained. The first factor accounted for 58.7% of the variance (eigenvalue = 5.26) and the second factor accounted for 17.3% of the variance (eigenvalue = 1.56). As Table 1 shows, all of the affective items loaded on the first factor and all of the cognitive items loaded on the second factor. The correlation between the two factors was $r = .48$. In sum, the results of the factor analysis suggest reasonable discriminant and convergent validity for the two scales.

Affect, cognition, and global attitude scores were computed by averaging items within the scales (rs for the scales were .95, .81, and .95, respectively) and reversing the direction of negatively phrased items such that higher scores were more positive. The mean scores of smokers versus nonsmokers were then compared. Predictably, smokers had more positive global attitudes towards smoking than did nonsmokers ($M = 5.01$ and $M = 2.00$), $F(1,103) = 99.81$, $p < .001$. Smokers' versus nonsmokers' scores on affect and cognition will be presented in the next section.

Smoking Status by Affect/Cognition ANOVA

To determine whether smokers versus nonsmokers differed in their cognition and affect toward smoking, we conducted a 2-way mixed model ANOVA with
smoking status as the between-participants factor and cognition versus affect scores as the within-participants factor. Both main effects and the interaction were significant ($p < .001$ in all cases). Affect scores were more positive than cognition scores ($M = 3.46$ and $M = 1.72$), smokers were more positive about smoking than were nonsmokers ($M = 3.30$ and $M = 1.88$), and, most importantly, the difference between affect and cognition scores was significantly greater for smokers than for nonsmokers (means are 4.62 and 1.97 for smokers' affect and cognition scores, respectively, and 2.30 and 1.46 for nonsmokers'3), though both simple effects were significant ($p < .05$ in both cases).

**Frequency Analyses**

To gain further insight into the relationship between cognition, affect, and smoking status, cognition and affect scores were divided at the sample medians ($Md = 1.25$ and $Md = 3.00$) to create four categories of judgments of smoking (low affect/low cognition, low affect/high cognition, high affect/low cognition, and high affect/high cognition). These four categories were then crosstabulated with smoking status (see Table 2).

Consistent with the view that smoking cigarettes is more affectively than cognitively driven, 92% ($N = 34$) of current smokers fell into a positive affect category, compared to only 26% of current nonsmokers, $\chi^2(1) = 38.45$, $p < .001$. There was also a relatively weaker, but significant, cognition effect. Smokers were more likely than nonsmokers to give smoking a positive cognition (65 and 38%), $\chi^2(1) = 5.79$, $p < .02$. Finally, there are some interesting comparisons that can be made within each cognition group. Specifically, both for those who gave smoking negative and positive cognitions, a greater percentage of smokers than nonsmokers were in a positive affect category ($p < .001$ in both columns of Table 2, respectively).2 In contrast, within each affect category, the smokers and nonsmokers were not significantly more or less likely to indicate positive or negative cognitions of smoking ($p > .1$ in both analyses, respectively).3 It should be

\[\text{\footnotesize 2} \text{ Fisher's exact tests were performed in those cases where any of the expected cell frequencies were less than 5.}\]

\[\text{\footnotesize 3} \text{ Fisher's exact tests were performed in those cases where any of the expected cell frequencies were less than 5.}\]

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**Table 2**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Low cognition</th>
<th>High cognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low affect</td>
<td>2 (5%)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>High affect</td>
<td>11 (30%)</td>
<td>23 (62%)</td>
</tr>
<tr>
<td>Nonsmokers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low affect</td>
<td>33 (49%)</td>
<td>17 (25%)</td>
</tr>
<tr>
<td>High affect</td>
<td>9 (13%)</td>
<td>9 (13%)</td>
</tr>
</tbody>
</table>
remembered, however, that there was a significant smoking status by cognition effect when collapsed across affect categories (as opposed to within each affect category). Thus, consistent with the ANOVA data, the frequency data indicate that affect provides a better basis for distinguishing between smokers and nonsmokers than does cognition.

**Predicting Global Attitudes from Affect and Cognition**

Zero-order correlations were conducted to predict global attitude from cognition and affect for smokers and nonsmokers (see Table 3). We also computed partial correlations between affect and global attitude (controlling for cognition) and between cognition and global attitude (controlling for affect).

As Table 3 indicates, cognition and affect both significantly (and independently) predict nonsmokers’ global attitudes. In contrast, for smokers, only affect predicts global attitudes. Further, this pattern of findings obtains regardless of whether zero-order or partial correlations are considered.

To double-check the conclusion that cognition predicts global attitude better for nonsmokers than for smokers, a Fisher’s $r$ to $Z$ transformation was used to compare the cognition–attitude correlation between the two groups. Consistent with the conclusion, this correlation was significantly greater for nonsmokers ($r = .75$) than for smokers ($r = .30$), $Z = 2.75, p < .01$. Moreover, the difference between the partial correlation between affect and attitude ($r = .56$) and the partial correlation between cognition and attitude ($r = .25$) approached statistical significance among smokers [$t(34) = 1.61, p < .07$], thereby further suggesting that affect, and not cognition, is the main determinant of global attitude for smokers.

**Within-Group Analyses**

While differences between smokers and nonsmokers in the strength of the associations between cognition and attitude and affect and attitude support the discriminant validity of these constructs, we have not, so far, clearly demonstrated that cognition and affect have significantly different relationships with a criterion variable within the same group of participants. We therefore examined the
correlations between affect, cognitions, and a number of variables that were specific to the smoking and nonsmoking groups. In particular, we examined the correlations between affect, cognition and having previously been a smoker among nonsmokers and the correlations between affect, cognition and intentions to give up smoking among smokers. Consistent with the data presented in Table 2, we found that having been a smoker was significantly more highly correlated with affect than cognition among nonsmokers \((r = .33 \text{ and } r = -.04), r(65) = 1.81, p < .05\). In other words, although previous smoking was associated with more positive affect toward smoking, it was not related to cognitions of that behavior.

Let us now consider current smokers. Neither cognitions nor affects were significantly related to (immediate) intentions to give up smoking among these people \((r = .22 \text{ and } r = .28, p > .1 \text{ in both cases})\). Importantly, however, affect was strongly correlated with how soon smokers intended trying to give up the habit \((r = .46, p < .01)\) and cognition was not \((r = -.17, p > .1), r(34) = 5.21, p < .001\). People with more negative affect toward smoking intended to try sooner to give it up than did people with more positive affect. One implication for health psychology is that interventions which stress the harmfulness or unhealthiness of smoking (cognitive information) are much less likely than those which attempt to change perceptions of pleasure (affective information) to influence people to try to quit the habit in the near future.

Variations in the Relationship between Affect and Cognition

Correlations between affect, cognitions, and criterion variables have demonstrated evidence of discriminant validity in terms of (a) differences in correlations between affect and a criterion versus cognition and the same criterion for different groups of participants (i.e., smokers versus nonsmokers) and (b) differences in the correlations between affect and a criterion versus cognition and the same criterion among the same participants. Perhaps the most convincing evidence of discriminant validity would be if the correlation between affect and cognition could be shown to vary as a function of a third variable such as smoking status. Because evidence suggested that smokers are both aware of the serious health consequences of their behavior (negative cognition) and still find it extremely enjoyable (positive affect), we anticipated a divergence between affects and cognitions toward smoking. This would be reflected in a small or nonsignificant correlation between cognition and affect among this group. Nonsmokers, on the other hand, were hypothesized to have more congruent affects and cognitions toward smoking. Consistent with predictions, cognition and affect were not significantly associated among smokers \((r = .17, p > .1)\) while the relationship was highly significant among nonsmokers \((r = .50, p < .01)\). The difference between the two correlations was also statistically reliable \((Z = 1.80, p < .05, \text{ one-tailed})\).

We also examined whether the correlation between cognition and affect might vary as a function of other variables. One variable—having attempted to give up smoking in the past—was found to moderate the relationship between cognition and affect. Among current smokers who had previously tried to give up smoking
(N = 20), there was a significant positive association between cognition and affect scores (r = .42, p < .05). In contrast, the correlation between cognition and affect was negative and nonsignificant among current smokers who had never tried to quit (r = -.30). The difference between the two correlations was reliable (Z = 2.08, p < .05) and suggests that the attitudes of people who have attempted to quit show greater cognition–affect consistency than the attitudes of those who have not.

Explaining Variance in Intentions

To examine whether affect and cognition were capable of explaining variance in intentions above and beyond that which could be explained by global attitudes alone, two hierarchical multiple regression analyses were performed (for smokers and nonsmokers) where global attitude was entered at Step 1 and affect and cognition were entered at Step 2. Not surprisingly, global attitudes accounted for significant variance in intentions for both smokers and nonsmokers (r^2 = .16 for smokers and r^2 = .31 for nonsmokers), p < .02 in both cases. More interestingly, however, the addition of affect and cognition accounted for significant variance in intentions, above and beyond that which was accounted for by global attitudes alone (change in r^2 = .18 and .07 for smokers and nonsmokers, respectively, p < .05 in both cases).

Given that the combination of affect and cognition accounts for significant unique variance in intentions, is it affect or cognition that is mainly responsible? To address this question, we conducted four additional hierarchical regression analyses. In all of these analyses, as in those that were reported above, global attitude was entered at Step 1. However, in two of the analyses (separate analyses for smokers and nonsmokers), cognition was entered at Step 2 and affect at Step 3; but in the other two analyses, the reverse was true. The results were remarkably similar for both smokers and nonsmokers. Affect, regardless of whether it was entered at Step 2 or Step 3, always accounted for significant unique variance in intentions (p < .05 in all cases) and cognition never did (p > .1 in all cases). In sum, affect, but not cognition, seems to be related to intentions in a way that cannot be fully accounted for by a mediating effect of global attitudes.

EXPERIMENT 2

Although Experiment 1 provided support for the discriminant validity of cognition and affect toward a behavior, some potential objections to that study might be noted. First, our study examined a single behavior—smoking. It is possible that our findings pertain only to this behavior or to other health-related behaviors. Further, we found that affect predicted the criterion variable better than did cognition (similar to Breckler & Wiggins, 1989; Manstead and Parker, 1995). More convincing evidence of discriminant validity would be obtained if (a) the distinction could be demonstrated for other types of behavior and (b) cognition is a better predictor than affect in some instances. We anticipate that cognition will be a better predictor of studying than affect because undergraduates are likely to
view studying as beneficial though not particularly enjoyable (whereas smokers found smoking enjoyable though not particularly beneficial in Experiment 1).

A second objection to Experiment 1 is that the correlation between cognitive and affective beliefs is quite high \((r = .48)\). Clearly, it would be desirable to demonstrate that this correlation did not influence our findings.

Perhaps the most serious objection to Experiment 1, that also pertains to previous studies, is that the predictive validity of cognition and affect has not been demonstrated. Past research has all been cross-sectional and employed global attitudes and/or intentions as criterion variables. These studies do not rule out the possibility that responses to cognitive and affective items are simply reflections of such attitudes and intentions. A study examining relationships between cognition, affect and a prospective measure of behavior is therefore required.

Method

Participants and Procedure

One hundred sixty-four undergraduate students at a UK university participated in Experiment 2. They completed a questionnaire during the last week of the term before the winter vacation and reported their behavior 6 weeks later when they returned to classes.

Measures

For the purposes of the present experiment, “a day’s study” was defined as “a day during which you study for at least 3 hours.” This definition was printed on the top of each page of the questionnaire.

Cognition and affect. Pilot testing showed that the vast majority of students intended studying between 4 and 6 days each week over the winter vacation. To avoid difficulties with scale correspondence, participants were required to respond to two stems: “For me, studying 6 days per week would be…” and “For me, studying 4 days per week would be…” Seven-point bipolar scales were used to measure cognition and affect. Three items were used to measure cognition (worthwhile—worthwhile, useful—useless, beneficial—not beneficial to my marks) and three were used to measure affect (pleasant—unpleasant, satisfying—unsatisfying, interesting—boring).

Subsequent behavior. The questionnaire given after the end of winter vacation also had the definition of “a day’s study” printed at the top of the page. Participants responded to the item “How many days a week did you spend studying over the Christmas holidays?” (responses ranged from 0 to 7 days/week). To determine that the measurement of behavior was reliable, a subsample \((n = 20)\) responded to the same question two weeks after completing this questionnaire. The test–retest correlation was high \((r = .95)\) indicating good reliability.

Results

Factor Analysis

Again we used an iterative principal axis factor extraction method with an oblique rotation. Two factors accounting for 56.4% of the item variance were obtained. The first factor accounted for 35.2% of the variance (eigenvalue = 4.22) and the second accounted for 21.2% of the variance (eigenvalue = 2.55). As Table 4 shows, all affective items loaded on Factor 1 and all cognitive items loaded on Factor 2. An exception was “satisfying—unsatisfying” which loaded more highly on Factor 1 as we expected, but also had loadings greater than .30 on the cognition factor. Importantly, however, the correlation between the two factors was only \(r = .16\). This value is considerably smaller than the correlation
TABLE 4
LOADINGS FOR A TWO-FACTOR OBLIQUE SOLUTION

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleasant (4 days)</td>
<td>.84</td>
<td>-.10</td>
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<tr>
<td>Pleasant (6 days)</td>
<td>.73</td>
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</tr>
<tr>
<td>Interesting (6 days)</td>
<td>.74</td>
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<td>Interesting (4 days)</td>
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<td>.69</td>
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obtained in Experiment 1 and in other studies, and demonstrates that cognition and affect can be relatively independent of each other.

**Correlations with Behavior**

As in Experiment 1, we again averaged relevant items to compute affect and cognition scales (as were .85 and .80 for cognition and affect, respectively). Pearson correlation coefficients were then computed between affect, cognition, and the measure of subsequent behavior. Both affect and cognition were significantly related to behavior in these analyses ($r = .26$ and $r = .36$, respectively, $p < .01$ in both cases). To determine which was the more powerful predictor, we computed partial correlations between cognition and behavior controlling for affect, and between affect and behavior controlling for cognition. In line with our predictions, cognition was a significant predictor ($r = .22, p < .01$) when affect was controlled for but affect was not significantly correlated with behavior when cognition was controlled for ($r = .09, p > .1$). Thus, while affect is a more powerful predictor of smoking than is cognition (Experiment 1), cognition is better than affect at predicting studying (Experiment 2).

**EXPERIMENT 3**

Although Experiments 1 and 2 demonstrated, in what we hope is an impressive variety of ways, the discriminant validity between affective and cognitive beliefs about behaviors, we have not yet tested the associative hypothesis that affective beliefs are likely to become more strongly associated with other affective beliefs than with cognitive beliefs, and that cognitive beliefs are likely to become more strongly associated with other cognitive beliefs than with affective beliefs. Experiments 3–5 test an implication of this associative hypothesis that, if people are asked to recall their beliefs about a behavior (presuming that they had previously used these beliefs to come to a behavioral decision), then their recall
protocols should be clustered by belief type. To see the basis of this implication, suppose a person retrieves a cognitive belief. According to the associative hypothesis, the associative pathways connecting to other cognitive beliefs are stronger than those connecting to affective ones. Thus, the person is likely to traverse an associative pathway to another cognitive belief and retrieve it. An analogous process describes the retrieval of an affective belief after another affective belief has been previously recalled. In sum, then, cognitive beliefs should be retrieved together and affective ones should be retrieved together, but only when people have previously used these beliefs to come to a behavioral decision (see Trafimow & Fishbein, 1995; Trafimow & Duran, 1998; Duran & Trafimow, 1998, for similar reasoning applied to other kinds of beliefs). When beliefs are processed for other reasons (e.g., memorization or guessing other people’s intentions), then there is less reason for people to distinguish which ones are affective from which ones are cognitive, and thus strong associations of the type described above are less likely to result.

Method

Participants
Twenty-five undergraduate students at a UK university participated in the experiment.

Procedure
Participants were randomly divided into three groups. One group of participants was instructed to “Suppose you are in a situation where you have an opportunity to perform a behavior. In addition, suppose that the following statements are true of the behavior. Your task is to indicate how likely you would be to intend to perform the behavior.” In contrast, participants in the memorization condition were instructed as follows: “The statements below describe a behavior. Your task is to memorize the statements as you will later be asked to recall them. We want you to use the following strategy. First, read the sentence. Second, close your eyes and repeat the sentence to yourself. Finally, go on to the next sentence. There are eight sentences.” Finally, participants in a second control group were instructed to “Suppose a person named Sarah was in a situation where there was an opportunity to perform a behavior. In addition, suppose that the following statements are true of the behavior. Your task is to indicate how likely Sarah would be to intend to perform the behavior.”

After they received the instructions, participants were presented with eight statements about the behavior, but they were never told what the behavior actually was. Four of these statements were affective (e.g., “you/Sarah may feel that performing the behavior is unpleasant”) and four of them were cognitive (e.g., “it could be useful to perform the behavior”). Further, half of the beliefs of each type were in favor of the behavior and half were against it. The affective and cognitive statements were alternated, so it was never the case that two items of a particular type were adjacent to each other. While the control participants were memorizing the items as was indicated by the instructions, the experimental participants and those in the “Sarah” condition indicated, on a 7-point likely-unlikely scale, the degree to which they/Sarah intended to perform the behavior. Finally, after a 5-minute delay task that was unrelated to the experiment, all participants were asked to recall the statements.

Results
The recall protocols were scored according to a “general meaning” criterion (Srull, 1984) before the data were analyzed. If the participant recalled the content of an item, it was scored as a correct recall. Each participant was then given a score indicating the extent to which the items he or she recalled were clustered by
type of item (affective or cognitive). The ARC index proposed by Roenker, Thompson, and Brown (1971) and recommended by Srull (1984) was used as the clustering measure. A score of 1 indicates perfect clustering and a score of 0 indicates chance clustering. That is, if participants recalled the items at random, their scores would have an expected value equal to 0. Negative scores indicate less than chance clustering.

According to the associative hypothesis, there should be more clustering in the experimental condition, where participants had been instructed to make a behavioral decision, than in either of the other conditions where the beliefs were presented with other processing objectives. Consistent with this hypothesis, ARC scores in the experimental condition were significantly greater than zero, the memorization condition, or the Sarah condition ($M = .61$ versus $M = -.59$ and $M = -.15$, respectively, and standard deviations are $.54$, $.34$, and $.76$, respectively), $p < .05$ for all comparisons.

One might attempt to account for these data on the basis of the number of items recalled. However, there are two arguments against this. First, the ARC index is not sensitive to this (see the demonstration by Roenker et al., 1971). Second, there were no discernable differences in the numbers of items recalled across the different conditions ($p > .1$ in all comparisons).

One might argue that participants used valence (whether the beliefs were in favor of or against the behavior) rather than affect/cognition to distinguish between the beliefs. However, when we tested clustering by valence in the experimental condition, the mean ARC was $-.37$ ($SD = .50$).

**EXPERIMENT 4**

We have now demonstrated that people associate affective beliefs with other affective ones and cognitive beliefs with other cognitive ones, but this only occurs when they have to decide whether or not to perform the behavior and does not occur when they have various other processing objectives (e.g., memorize the items or judge what someone else is likely to do). However, it is worth noting that participants in Experiment 3 were not actually told what the behavior was nor were they processing their own beliefs. Perhaps if participants were considering their own beliefs in the context of a known behavior, the clustering we obtained in the experimental condition might disappear.

**Method**

The idea underlying Experiment 4 was to have participants list their beliefs about a behavior and analyze these beliefs to test for clustering by belief type. We feared that if participants were simply told to write down their beliefs about a behavior, they might get confused about what kinds of beliefs to write down. Unfortunately, telling them to write down affective and cognitive beliefs might have caused them to cluster their responses by these categories even without such an a priori organization in memory. Thus, we included a condition where these categories were made accessible without, at the same time, priming participants to use them to organize their responses. However, on the chance that our fears were unfounded, we also included a control condition where participants were asked to list their beliefs about a behavior without any preliminaries.
Participants

Fifty-two introductory psychology students at an American university volunteered to participate in the present experiment.

Procedure

Participants in the prime condition were told about a (fictional) previous study where participants gave their views about using a condom during sex with someone they had met recently at a club. They were further presented with eight common responses. Half of these responses were affective and half were cognitive. Participants in the no prime condition were not presented with any of this information. Then all participants were told, "Our interest in the present study is on your views about smoking. Please write down responses you may have about YOUR performing this behavior."

There are two issues worth mentioning about the eight statements participants were given. First, because half of them were affective and half of them were cognitive, we hoped the participants would not be confused about the types of responses we wanted (and that we would actually elicit cognitive and affective responses). Second, and more importantly, because the prime statements were alternated by type (i.e., affective and cognitive), we hoped to avoid priming participants to cluster their responses by belief type. In fact, if anything, the order in which the priming statements were presented should have primed them to negatively cluster their responses. Therefore, if, as the associative hypothesis predicts, participants positively clustered their responses, we would have reason to believe that the priming statements were not responsible.

Results

Two people coded the data with 87% agreement ($\kappa = .74$). Consistent with the associative hypothesis, the mean ARC score was significantly greater than zero in both conditions [ARC = .32 (SD = .56) in the prime condition and .29 (SD = .57) in the no prime condition ($p < .05$ in both cases). Thus, the associative hypothesis holds even (a) when participants write down beliefs they have about a behavior that is well known to them and (b) whether or not they are primed to negatively cluster their responses. Further, the data cannot be accounted for by an assumption that people used valence to distinguish between the two types of beliefs; when ARC scores were computed on the basis of valence, the mean ARC scores did not differ significantly from zero in either condition.

EXPERIMENT 5

Although the results from Experiment 4 were consistent with the associative hypothesis, we felt that there were two issues that needed to be addressed in Experiment 5. First, it is possible that our coding of beliefs as being affective or cognitive might not be the same as how participants themselves would have coded them if they had been given the opportunity. Second, we wanted to obtain a clustering effect for a different behavior to provide support for the generality of the associative hypothesis.

Method

Participants

Nineteen undergraduates at an American university volunteered to participate in the present experiment.
Beliefs

Procedure

All participants were asked to “Write down 6 beliefs you have about having unprotected sex next weekend.” After doing so, they were instructed to “Go back over the lists you have made and mark each item with an ‘E’ for cognition or an ‘A’ for affect. A cognition is a statement about the consequences of the behavior, for example, whether it will lead to a good or bad consequence. An affect is a statement about how the behavior makes you feel. If an item cannot be marked with an ‘E’ or an ‘A,’ then leave it blank.”

Results

On the basis of their own codings of each belief as being “E” or “A,” an ARC score was computed for each participant. Consistent with the associative hypothesis, the mean ARC score was .59 ($SD = .49$), which was significantly greater than zero, $t(18) = 5.29$, $p < .01$. Further, as in Experiments 3 and 4, the data cannot be accounted for by valence clustering; all but two of the participants failed to write down responses that differed with respect to valence, thereby rendering it impossible to compute valence ARC scores.

General Discussion

Findings from five experiments are relevant to the distinction between affective and cognitive beliefs. The discriminant validity of the distinction was supported by several findings obtained from Experiment 1. For example, affective and cognitive beliefs loaded on different factors; affect did a better job of distinguishing between smokers and nonsmokers than did cognition; although both affect and cognition predicted global attitude for nonsmokers, only affect was a significant predictor for smokers; previous smoking experience (among nonsmokers) was associated with affect, but not cognition; affect was correlated with how soon smokers intended trying to give up the habit, though cognition was not; affect and cognition were consistent with each other for nonsmokers but not for smokers; and affect accounted for unique variance in intentions even after controlling for global attitude for both smokers and nonsmokers, while cognition did not. Further, the data from Experiment 2 suggest that affect and cognition are sometimes not very correlated with each other, that cognition can sometimes better predict criterion variables than can affect (in contrast to Experiment 1), and that the affect–cognition distinction is useful for predicting actual prospective behaviors as well as global attitudes and intentions. In sum, even had we not tested the associative hypothesis in subsequent experiments, these demonstrations of discriminant validity between affective and cognitive beliefs about a behavior (as opposed to a thing) are a contribution to the literature.

In addition, however, support for the associative hypothesis was obtained from Experiments 3–5. Experiment 3 showed that participants’ recall protocols were clustered by belief type when they had previously considered the information to make a behavioral decision, but not in various control conditions. These findings suggest that it is during the process of making a behavioral decision that people form the hypothesized associations. Finally, Experiments 4 and 5 indicate that the clustering effect obtained in the experimental condition of Experiment 3 also
obtains even when people generate and code their own beliefs, the behavior is known, and they are primed _not_ to cluster.

**Another Look at Experiment 3**

There are some additional issues that seem particularly relevant to Experiment 3, which we view as being the most direct test of the associative hypothesis. First, we assumed that instructing participants to form an intention would induce them to forge associations in the hypothesized manner, but that other processing objectives would not. Clearly, the data are very consistent with this reasoning, but one might question why people in the “memorization” and “Sarah” (control) conditions did not form these associations. Concerning the memorization condition, we suspect that rehearsing the items prevented the formation of inter-item associations (see Srull, Lichtenstein, & Rothbart, 1985). It is notable that ARC scores in this condition were highly negative ($M = -.59$), which may reflect that the items were presented in a highly negatively clustered order. In fact, given this context, the high positive clustering in the experimental condition ($M = .61$) is particularly impressive.4

Our expectation of the obtained lack of clustering in the “Sarah” condition was based on research by Trafimow and Fishbein (1995). They suggested (and obtained supporting data) that it may not be as important to make distinctions when one is predicting the behavior of a stranger as when one makes a decision about one’s own behavior. Not only is one’s own behavior self-relevant, but the decision might come up again, in which case it is convenient to have already formed strong affective and cognitive concepts. In contrast, where a stranger’s behavior is concerned, the prediction is not self-relevant nor is it likely to come up again. Thus, there is less reason for people to form the hypothesized inter-item associations (see Potts et al., 1989, for an elegant demonstration of similar reasoning applied to schema formation).

This brings up a second issue. Although the lack of difference in numbers of items recalled is convenient for ruling out alternative explanations, one could interpret the above argument as implying that such differences should have been obtained. That is, if more inter-item associations were formed in the experimental than in the control conditions, recall should be better in the former condition than in the latter ones. On the other hand, several explanations can be easily invented to account for the lack of differences in recall. For example, because there were only eight items to recall, a ceiling effect might have equated the overall levels of recall in the three conditions. Or, where only a few items are presented, rehearsal may be as effective a mnemonic device as forming associations. Additionally, participants in the “Sarah” condition may have performed some elaborative processing on the items which equated their ease of retrieval with that in the experimental condition. In sum, as is usually the case, a variety of explanations can be invented to account

4 If each participant had retrieved all eight of the items in the “baseline” order (the order presented), the mean ARC score would have been $-1$. 
for null findings. Thus, given the strong ARC differences, the lack of differences in overall recall between the conditions does not seriously threaten the associative hypothesis.

**Expectancy–Value, Attitude, Cognitive Limitations, and Measurement**

According to several important theories (e.g., Fishbein, 1980; Ajzen, 1988), a person's attitude towards a behavior is determined by his or her expectancies about the consequences of performing the behavior and the values that get placed on them; each expectancy is multiplied by its associated value, and the products are summed to determine attitude. The present data suggest a modification of this idea. Specifically, the data suggest that people distinguish between affective and cognitive beliefs and form associations only among beliefs of a similar type. Thus, if people perform an expectancy–value process, they seem to do it separately for the two kinds of beliefs.

The associative hypothesis is consistent with a statement by Fischoff, Gottlein, and Shapira (1982) that people have cognitive limitations and therefore cannot consider a large set of beliefs when determining an attitude. According to the associative hypothesis, it is not necessary to do this. Rather, people can extract, on the basis of comparing affective beliefs with other affective beliefs and cognitive beliefs with other cognitive beliefs, a general concept about “how performing behavior X makes me feel” and a general concept about “how good it is to perform behavior X.” If these concepts are congruent, the decision of what to do is obvious. If the two are incongruent, the decision is less obvious. But even in the latter case, it may be easier to deal with two general concepts than with a large set of beliefs. It is interesting to note that a great deal of literature indicating that people use their affect as information is consistent with this speculation (Schwarz, 1990; Schwarz & Clore, 1988).

**Conclusion**

Although the present data support the associative hypothesis, it has not been investigated as thoroughly as would be desirable; there are several additional predictions that could be tested in future experiments. For example, researchers could use a cued-recall paradigm where an affective or cognitive belief is used as a cue. If associations are formed in the manner indicated by the associative hypothesis, the subsequent item recalled should be consistent with the cue (i.e., an affective cue elicits the recall of an affective belief and an cognitive cue elicits the retrieval of a cognitive belief). Another possibility is to measure the interresponse times for writing down affective and cognitive items. If associative pathways exist between affective and other affective beliefs, then a person can retrieve two affective items in a row simply by retrieving one of them and then traversing an associative path to a second one. Similar reasoning applies to cognitive items. In either case, interresponse times should be relatively quick. But if such retrieval routes have not been formed between affective and cognitive items, then there is no “convenient” way of getting from the first item retrieved (e.g., an affective
belief) to the second item (e.g., a cognitive belief) and interresponse times should be relatively slow. More generally, there are several testable implications of the associative hypothesis that can, and should, be investigated in future research.

REFERENCES


BELIEFS