Distinguishing Between Perceived Behavioral Control and Self-Efficacy in the Domain of Academic Achievement Intentions and Behaviors

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We examined whether perceived behavioral control (PBC) and self-efficacy (S-E) can be distinguished empirically, and whether they make different contributions to the prediction of intentions and behavior. The behavioral criterion was performance in 3 high-school examinations. Measures of attitude, subjective norm, PBC, S-E, and intention were taken before the examinations. Grade achieved served as the behavioral measure. Factor analysis of items intended to measure PBC and S-E extracted 2 factors: confidence in ability to achieve the behavioral outcome, and belief that the outcome can be influenced by own efforts. Scores on these factors were labeled S-E and perceived control, respectively. Behavior was predicted better by S-E than by intentions, and intentions were more closely related to S-E than to attitudes, subjective norms, or perceived control.

Ajzen's (1985, 1988) theory of planned behavior (TPB) is a development of Fishbein and Ajzen's (1975; Ajzen & Fishbein, 1980) theory of reasoned action (TRA). The main difference between the two models is the addition of perceived behavioral control (PBC) as a construct in the TPB. PBC is defined as a person's estimate of how easy or difficult it will be for him or her to carry out the behavior (Ajzen & Madden, 1986). As shown in Figure 1, PBC is regarded by Ajzen as codetermining intentions, along with attitude to behavior and subjective norm; and (under specific circumstances, at least) as codetermining behavior, together with intention. The rationale for the first of these two links is straightforward. When we form intentions to engage in specific behaviors, argues Ajzen (1988), we take into account how much control we have over these behaviors. Assuming that the behavior is one that the person would, other things being equal, like to carry out, the influence of PBC on intention will be positive: Greater PBC should result in stronger intentions to perform the behavior in question.

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1375

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Figure 1. Theory of planned behavior (after Ajzen, 1988).

The rationale for the second link is more complex and takes two forms. The first of these concerns the relationship between actual control and perceived control over the behavior in question. Here the argument is that to the extent that the behavior is not under full volitional control, intentions will be less good predictors of behavior. This is because the intention-behavior relationship depends on the individual being able to turn his or her intentions into behaviors when he or she wants to. If his or her actual control is low, this ability to turn intentions into behaviors will be reduced. Thus, behavior will be partly determined by intentions and partly determined by the amount of actual control over the behavior. If PBC is a good reflection of actual control (e.g., because the individual has much experience of the behavior in question), then PBC will serve as a proxy for actual control and codetermine behavior, together with intentions. This was the rationale originally offered by Ajzen (1985) for the direct link between PBC and behavior.

The second rationale is more psychological in nature and concerns the motivational impact of PBC. Here, Ajzen (1991) argues that if one holds strength of intention constant, the amount of effort that persons will engage in to execute the intended behavior will be a function of PBC. The argument is that when barriers and obstacles impeding performance of the behavior are encountered, individuals with a high PBC will be more inclined to persist in carrying out the behavior. For instance, with quitting smoking, as every would-be ex-smoker knows, there are factors that interfere with successful performance of this behavior. Those who see themselves as having a relatively high degree of control over the behavior should be better able, according to this argument, to overcome these obstacles and to persist with not smoking. As with the other rationale, this leads one to expect that PBC will be a positive predictor of behavior.

Since the earliest days of the TPB, there has been a degree of unclarity concerning the relationship between PBC and the self-efficacy (S-E) construct that plays a key role in Bandura's (1977, 1982, 1986, 1997) social learning theory. *Self-efficacy* is defined as "people's beliefs about their capabilities to produce performances that influence events affecting their lives" (Bandura, 1995, p. 434). People with a strong sense of S-E approach difficult tasks as challenges to be mastered, rather than as personal threats to be avoided: They are committed to their goals and maintain a task focus that guides effective performance, rather than dwelling on personal deficiencies and on the obstacles they will encounter. They increase effort in the face of failure and attribute failure to lack of effort, rather than giving up easily and attributing failure to personal lack of ability. In other words, the greater one's S-E, the more likely it is that one will actually carry out an intended behavior.

Clearly, there is some degree of overlap between PBC and S-E. Both constructs are concerned with control: the perceived ease or difficulty of performing a behavior (PBC), and the belief that one is capable of performing a behavior (S-E). What, if anything, is the difference between these two constructs? One way of distinguishing between them is to draw on the notion that control comes in two forms: internal control, based on factors that come from within the individual (such as ability and motivation); and external control, based on factors that come from outside the individual (such as task difficulty, cooperation of others, access to necessary resources, and luck). This argument has been developed by Terry and her colleagues (Terry, 1993; Terry & O'Leary, 1995; White, Terry, & Hogg, 1994). They argue that PBC should be used to refer to external constraints on behavior, and that S-E should be used to refer to internal control factors. These investigators have conducted studies of exercise behavior and condom-related behavior in which S-E measures were found to be independent predictors of intentions, whereas PBC measures were not. By contrast, PBC measures have been found by these researchers to be predictive of behavior, whereas S-E measures were not.

A somewhat different line has been adopted by Sparks and his colleagues (Guthrie & Sparks, 1997; Sparks, Guthrie, & Shepherd, 1997). These authors distinguish between perceived difficulty and perceived control. In their terms, *perceived difficulty* refers to the perceived ease or difficulty of performing the behavior in question (e.g., "For me to do X would be ... [easy-difficult]"). *Perceived control*, by contrast, refers to the degree of control over the behavior as perceived by the individual (e.g., "How much personal control do you feel you have over whether or not you do X? [complete control-no control]"). Both Sparks et al. (1997) and Guthrie and Sparks (1997) found that perceived difficulty predicted dietary intentions, whereas perceived control did not. As noted by Sparks et al. (1997) and by Armitage and Conner (1997), the findings of Sparks and his colleagues are not necessarily inconsistent with those of Terry and her associates: In the context of Sparks and colleagues' research, perceived difficulty may refer more to internal resources (e.g., It is easy for me to do X because I have the ability to do it) than to external resources (e.g., It is

difficult for me to do X because I do not have the requisite money). If so, the findings of Sparks and colleagues would be compatible with those of Terry and associates.

Armitage and Conner (1997) present a perspective on this issue that is closer to the one adopted by Terry and colleagues. They distinguish between S-E, defined as confidence in one's ability to carry out a behavior and *perceptions of control over the behavior*, defined as the extent to which people perceive control over external resources, like availability or money. They argue further that these constructs should be discriminable but that they will not be independent of one another. Thus, being very confident of one's ability to perform a behavior may, it is suggested, lead to underestimation of external control; likewise, the presence of external facilitatory factors may boost S-E perceptions. Consistent with Terry and colleagues, Armitage and Conner found that S-E predicted dietary intentions; although perceptions of (external) behavioral control did not predict behavior, the authors suggested that this was because the behavior in question (eating a low-fat diet) was relatively high in control. If external control was a more powerful determinant of food choice, they argue, perceptions of external control might well have a direct impact on behavior.

Also relevant is a study by McCaul, Sandgren, O'Neill, and Hinsz (1993). These authors report two studies examining the value of adding measures of PBC and S-E to a standard TRA model in predicting different types of healthprotective intentions and behaviors. Somewhat at odds with the research just reviewed, it was found that PBC consistently added to the prediction of intentions and behaviors in both studies, whereas S-E did not do so. In this research, PBC was operationalized as the likelihood of successfully conducting the target behavior, assuming that an attempt to perform the behavior is made. S-E was operationalized as perceptions of the ability to carry out the behavior. Thus, the former measure assesses whether respondents see themselves as being able to implement the behavior, thereby implicitly taking account of internal and external control factors, whereas the latter measure only assesses one internal control factor. The broader scope of the PBC measure helps to account for McCaul et al.'s findings: Assuming that intentions and behaviors varied as a function of control factors other than ability, it is hardly surprising that the PBC measure was a better predictor of intentions and behaviors. As Bandura (1997) has noted, comparative tests of the two constructs should use measures that are equivalent in scope. Given that the behaviors studied by McCaul et al. were breast self-examination, testicular self-examination, toothbrushing, and tooth flossing, it seems unlikely that ability to carry out the behaviors was the only relevant control factor.

The present research was intended to reexamine the distinction between S-E and PBC by using measures of equivalent scope and a behavioral domain

different from those studied by Terry and her colleagues (exercise behavior, Terry & O'Leary, 1995; condom-related behaviors, White et al., 1994), by Sparks and colleagues (e.g., Sparks et al., 1997) and by Armitage and Conner (1997; dietary behaviors), and by McCaul et al. (1993; self-examination and dental behaviors). One motivation for this change of domain was to extend the range of behaviors in relation to which these theoretical issues are examined. Another consideration was that the selected domain—academic achievement—is one in which both internal and external control factors clearly can play a role in determining the outcome.

The participants were secondary school students in the Netherlands, and they were asked questions related to their performance in an upcoming examination. We used six items to assess the constructs of PBC and of S-E, believing some of these to be suited to assessing PBC and others to be suited to assessing S-E. Our two main objectives were (a) to establish whether these six items measure one construct or two, and (b) to see how these one or two constructs relate to other variables within the TPB, especially intentions and behavior. Our review of the previous evidence led us to expect that the six items would load on separate factors, one closer to S-E and the other closer to PBC. Further, we expected that a measure of S-E would predict intentions better than a PBC measure would. Evidence concerning the prediction of behavior is less conclusive, but the findings of Terry and colleagues (Terry & O'Leary, 1995) suggest that behavior would be predicted directly by PBC in combination with intentions, whereas S-E would not add to the prediction of behavior once intentions have been taken into account.

A final objective of this research was to examine the extent to which the two control-related constructs of S-E and PBC mediate the relationship between past behavior (i.e., previous achievement in the course concerned) and future behavior (i.e., grade achieved in the examination). As Ajzen (1991) has noted, the fact that past behavior tends to predict future behavior is not very illuminating, from a psychological perspective. In the context of academic achievement, the attainment of a particular grade in an examination cannot be said to be caused by the attainment of a similar grade in a prior examination. Rather, both grades are the result of one or more causal factors, such as ability and effort. Ajzen (1988) argues that perceptions of control (like other constructs within the TPB) will be influenced by previous behavioral outcomes. In principle, relationships between past and future behavior should be mediated by intentions and PBC. The role of PBC in codetermining behavior (along with intentions) should be greater where the person has experience with the target behavior (cf. Ajzen & Madden, 1986), because this experience will lead to greater accuracy in perceptions of control. Since participants in the present research are experienced in taking examinations, from the perspective of the TPB there are reasons

for thinking that the relation between past and future academic performance should be mediated by intentions and PBC. Similarly, Bandura (1997) argues that "Enactive mastery experiences are the most influential source of efficacy information because they provide the most authentic evidence of whether one can muster whatever it takes to succeed" (p. 80). Furthermore, the role of efficacy beliefs in determining behavior should become stronger as experience with the behavior increases (cf. Wood & Bandura, 1989). From the perspective of social learning theory, then, there is reason to predict that the relation between past and future academic performance will be mediated by S-E.

Method

Participants

In total, 171 students (81 females, 90 males; average age = 15 years) at a Dutch high school participated in this study on a voluntary basis. The students were drawn from Years 3 (approximately 14 years old), 4 (approximately 15 years old), and 5 (approximately 16 years old). Within each of these years, there were three different classes, such that a total of nine classes participated in the study. Data were collected over a period of 2 days. Students participated in classroom settings that were similar for the various classes and year groups.

Questionnaire

Participants were asked 14 questions about each of three different courses: English, History, and Physics. Because not every student took all three courses, the numbers of students answering questions about a given course varied: English, n = 171; History, n = 158; Physics, n = 140. The questions all concerned the same behavioral goal, namely "achieving at least a 7 [out of 10] for English [History, Physics] in the upcoming exam." This was selected as a suitable behavioral goal after examining the average grades achieved by these students in their coursework. These averages were all between 6.0 and 7.2, with the overall average across participants and across courses being 6.7. Thus, attaining a 7 was a behavioral goal that was realistic in light of previous performance, being neither too easy nor too difficult to achieve. Grades achieved by students in their coursework served as a measure of past behavior.

Four semantic differential scales were used to assess attitude, following the sentence stem "My achieving at least a 7 for English [History, Physics] in the upcoming exam would be: good-bad, pleasant-unpleasant, useless-useful, and unattractive-attractive." Two items were used to assess subjective norm: "Most people who are important to me think that I should . . ." and "I feel that I am under social pressure to . . ." Both items were answered on 7-point *agree*-

disagree scales. Intention was measured by two items: "I aim to ..." and "I expect to achieve at least a 7 for English [History, Physics] in the upcoming exam." Strictly speaking, of course, the second of these items assesses expectation, rather than intention (cf. Warshaw & Davis, 1985). These items were also answered using 7-point agree-disagree scales. Cronbach's alphas or bivariate correlations for these measures were deemed to be satisfactory (attitude: English = .81, History = .92, Physics = .93; subjective norm: English, r = .31, p < .01, History, r = .48, p < .01, Physics, r = .48, p < .01; intention: English, r = .50, p < .01, History, r = .43, p < .01, Physics, r = .44, p < .01), so scores within disciplines were averaged across the relevant items to form an index of each construct.

Six items were used to assess control-related constructs. The first two were intended to measure PBC: "Whether or not I attain at least a 7 for [course] in the upcoming exam is completely up to me" (*agree-disagree*); and "How much control do you have over whether you attain at least a 7 for [course] in the upcoming exam?" (*none-complete*). A further three items were intended to measure S-E: "I am certain that I can attain at least a 7 for [course] in the upcoming exam" (*completely disagree-completely agree*); "How confident are you that you will attain at least a 7 for [course] in the upcoming exam?" (*very little-a great deal*); and "There is a lot that I can do to be sure of attaining at least a 7 for [course] in the upcoming exam." (*completely disagree-completely disagree-completely agree*). The final item was one that has been used by some researchers to measure PBC and by others to measure S-E: "Attaining at least a 7 for [course] in the upcoming exam is for me ..." (*very difficult-very easy*).

Results

Separate factor analyses were carried out on the six control-related items for each of the three courses. Since there are reasons for thinking that any underlying factors would be correlated, we used principal components analysis with oblique (SPSS OBLIMIN) rotation. The results are summarized in Table 1. The findings are consistent across the three courses. In each case, there was a two-factor solution that explained between 75% (English) and 82% (Physics) of the variance, and in only the case of Physics was there an item ("How much control do you have?") with a loading higher than .40 on both factors.

We interpret Factor 1 as representing a construct very close to S-E. It reflects confidence in one's ability to achieve the behavioral outcome. By contrast, Factor 2 appears to reflect an assessment of the degree to which one can influence the behavioral outcome. Thus, you can admit that there is "much that you can do to attain at least a 7," or that "whether or not you achieve at least a 7 is completely up to you," and yet at the same time not be confident that you can

Table 1

Factor Structure of Control Items (Principal Components Analysis With Oblique Rotation)

Item	Factor 1	Factor 2
(a) Engli	sh	
How confident are you?	.925	
I am certain that I can	.900	
Difficult-easy	.917	
There is a lot that I can do		.859
Completely up to me		.753
How much control do you have?		.653
(b) Histo	ry	
How confident are you?	.851	
I am certain that I can	.922	
Difficult-easy	.924	
There is a lot that I can do		.845
Completely up to me		.896
How much control do you have?		.615
(c) Physi	cs	
How confident are you?	.914	
I am certain that I can	.966	
Difficult-easy	.967	
There is a lot that I can do		.920
Completely up to me		.836
How much control do you have?	.491	.498

achieve at least a 7. The results suggest that control perceptions in this domain embrace two different issues. The first is confidence in one's ability to achieve the target grade and will be referred to as *self-efficacy*. The second concerns belief in the extent to which the behavioral outcome can be influenced by one's

Means, Standard Deviations,	, and Zero	-Order Cor	relations of	Principal V	ariables			
Variable	W	SD	-	2	3	4	5	9
		(a) Englisl	n (ns range 1	from 170 to	171)			
1. Attitude	5.68	1.08	1.00					
2. Subjective norm	3.22	1.41	.04	1.00				
3. Self-efficacy	0.00	1.00	50**	.05	1.00			
4. Perceived control	0.00	1.00	07	.31**	.33**	1.00		
5. Intention	5.19	1.35	38**	.11	.83**	.20*	1.00	
6. Previous behavior	6.66	1.24	36**	11	.37**	04	.33**	1.00
7. Behavior	6.92	1.53	30**	01	.52**	.17*	.43**	.41**
		(b) Histor	y (ns range 1	from 155 to	158)			
1. Attitude	5.68	1.31	1.00		×			
2. Subjective norm	3.51	1.56	.21**	1.00				
3. Self-efficacy	0.00	1.00	53**	17*	1.00			
4. Perceived control	0.00	1.00	10	04	46**	1.00		
5. Intention	5.53	1.06	36**	06	.75**	.42**	1.00	
6. Previous behavior	6.92	0.92	40**	23**	.55**	.26**	.46**	1.00
7. Behavior	6.76	1.19	45**	20*	43**	.19*	.37**	**65.
		(c) Physics	s (ns range f	rom 138 to	140)			
1. Attitude	6.19	1.18	1.00					
2. Subjective norm	3.82	1.73	.02	1.00				
3. Self-efficacy	0.00	1.00	58**	.08	1.00			
4. Perceived control	0.00	1.00	08	.08	.42**	1.00		
5. Intention	4.98	1.30	42**	.20*	.81**	.34**	1.00	
6. Previous behavior	6.50	1.21	48**	04	.63**	.11	.55**	1.00
7. Behavior	6.33	1.86	36**	.04	.51**	.10	.47**	.63**
p < .05. ** $p < .01$.								

Table 2

PERCEIVED BEHAVIORAL CONTROL AND SELF-EFFICACY 1383

personal efforts and will be referred to as *perceived control*. We computed separate factor scores for these two factors for each of the three courses, and used these factor scores in all further analyses.

We turn now to the second issue addressed in this research; namely, how do these two constructs (i.e., S-E and perceived control) relate to (a) behavior, as measured by the grades students actually achieved, and (b) behavioral intentions. Zero-order correlations among the variables (together with their means and standard deviations) are reported separately for each course in Table 2. Two aspects of the findings are noteworthy. First, contrary to expectations, the attitudinal measure was consistently negatively related to intentions, past behavior, and behavior. This surprising finding can be accounted for in terms of the way in which participants construed the question used to elicit the attitudinal ratings. This is an issue we will return to. Second, the S-E measure was consistently positively related to intentions, past behavior, and behavior. Although perceived control was also positively and significantly related to intentions, the relation is weaker than that between S-E and intentions; the relations between perceived control and the two behavioral measures also tended to be weak, and were not always significant.

Prediction of Behavior

Behavior, in the form of the grade actually achieved in the exam, was regressed hierarchically onto predictor variables in an order determined by theoretical considerations. The first predictor entered into the equation was intention; at Step 2 we entered S-E and perceived control; and at Step 3 we entered past performance, in the form of the student's average grade previously achieved in each of the three courses. The results of these analyses are shown in Table 3.

What we find in each equation is a tendency for the significant predictor of behavior at a given step to be displaced by a more important predictor entered on a subsequent step. Thus, in each equation, intention, entered at Step 1, explains a significant proportion of the variance in grade achieved. However, it is no longer a significant predictor at Step 2, when S-E and perceived control are entered; in each case, S-E (but not perceived control) is a powerful predictor of outcome. In turn, in two of the three equations, S-E is no longer a significant predictor when past performance is entered into the equation. In summary, the best predictor of outcome is past performance, followed by S-E.

Prediction of Behavioral Intentions

Intentions were regressed onto attitudes and subjective norms (Step 1), selfefficacy and perceived control (Step 2), and past performance (Step 3). The

Table 3

Step	Predictor	<i>R</i> ²	ΔR^2	Beta in	Beta
		(a) English			
1	Intention	.18	.18	.42**	03
2	Self-efficacy			.52**	.44**
	Perceived control	.27	.09	.00	.02
3	Past performance	.33	.06	.26**	.25**
		(b) History			
1	Intention	.14	.14	.38**	.06
2	Self-efficacy			.35**	.12
	Perceived control	.19	.05	02	01
3	Past performance	.37	.18	.50**	.50**
		(c) Physics			
1	Intention	.21	.21	.46**	.08
2	Self-efficacy			.46**	.17
	Perceived control	.28	.07	14	05
3	Past performance	.42	.14	.49**	.49**

Hierarchical Regression of Behavior (i.e., Grades Achieved) on Intentions, Self-Efficacy, Perceived Control, and Past Performance

***p* < .01.

results are shown in Table 4, and exhibit a consistent pattern. Considering first the final regression equations, S-E was a highly significant predictor of intentions in all three courses. Perceived control was only a significant predictor in the case of English, where the negative beta weight suggests that it acts as a suppressor variable. Subjective norm was a significant predictor of intentions in the case of English and Physics. In no case was attitude or past performance a significant predictor of intentions. Turning now to the "beta in" column, we see that on the first step of all three regression equations, attitude was a significantly negative predictor of intentions. This is consistent with the zero-order correlations previously described. It creates a degree of ambiguity with respect

Table 4

Step	Predictor	R^2	ΔR^2	Beta in	Beta
		(a) English			
1	Attitude			38**	.08
	Subjective norm	.15	.15	.12	.09*
2	Self-efficacy			.90**	.88**
	Perceived control	.70	.55	12*	12*
3	Past performance	.70	.00	.05	.05
		(b) History			
1	Attitude			36**	.03
	Subjective norm	.14	.14	.01	.06
2	Self-efficacy			.73**	.69**
	Perceived control	.58	.44	.09	.08
3	Past performance	.58	.00	.09	.09
		(c) Physics			
1	Attitude			44**	.05
	Subjective norm	.23	.23	.19*	.13*
2	Self-efficacy			.83**	.78**
	Perceived control	.67	.44	01	.00
3	Past performance	.68	.01	.09	.09

Hierarchical Regression of Examination Intentions on Attitude, Subjective Norm, Self-Efficacy, Perceived Control, and Past Performance

p* < .05. *p* < .01.

to the interpretation of the beta weights for the intention regressions: It may well be that if attitude had played a more conventional role in explaining intentions, predictors such as subjective norm would not have achieved statistical significance. However, given the strength of the relationship between S-E and intentions, it seems highly unlikely that this would apply to this variable.

Discussion

The present study had three main objectives: to assess the empirical discriminability of measures of S-E and PBC; to identify the roles played by these measures in the prediction of behavior and intentions; and to examine the extent to which these measures mediate the relation between past and future behavior. With respect to the first objective, the clear conclusion to be drawn is that items which have been used in previous research to measure the constructs of S-E and PBC do constitute two sets of items, each tapping a different component. As previously argued, the item loadings suggest that one factor taps conviction in one's ability to achieve the behavioral outcome (S-E), while the other reflects a belief that the outcome can be influenced by one's own efforts (perceived control).

This is a somewhat different conclusion from the one reached by Terry and her colleagues (e.g., Terry & O'Leary, 1995). As noted earlier, their analysis of this issue suggests that the most appropriate conceptual division is between those control factors that are internal to the individual and those that are external to the individual. Reexamining the items used in the present research, it is possible that not enough measures explicitly referring to external control factors (such as perceived difficulty of the exam or amount of time available for revision) were included to provide a fair test of this distinction. However, the items we used are ones commonly employed by researchers to measure control-related constructs, and we found that these items do not (in the domain of academic achievement, at least) form a highly coherent set. It is well known that measures of PBC tend to have low internal consistency (e.g., Beale & Manstead, 1991). Here, as in other research, we see a possible reason for this: Control is a multidimensional construct.

If we conceive of control as being able to carry out an action or to attain a goal, the main (but not necessarily the only) dimensions of control are likely to be those identified by attribution theorists as shaping causal attributions for task performance: ability, effort, task difficulty, and luck (cf. Weiner, 1985). S-E relates directly to perceptions of ability to execute a behavior needed to produce a given outcome. PBC has tended to focus more on perceptions of how easy or difficult it is to perform a behavior needed to produce a given outcome. Insofar as ability is an internal factor and task difficulty an external factor, Terry's (e.g., Terry & O'Leary, 1995) distinction between internal and external control factors would appear to make sense. However, perceptions of ability, especially if the task is a difficult one. As Bandura (1997) notes, "The less efficacious people judge themselves to be, the more difficult the tasks will appear to them" (p. 127). In the present research, perceptions of how easy or difficult it was to achieve the target behavior loaded highly on the S-E factor, presumably

reflecting the fact that the outcome in question is one that is ability dependent: Without the requisite ability, it would be impossible to attain the outcome. In behavioral domains where less premium attaches to ability, it is conceivable that the *easy-difficult* scale would load on the perceived control factor. If this analysis is correct, defining PBC in terms of perceptions of how easy or difficult it is to perform the behavior in question creates the potential for this construct to overlap with S-E in domains where outcomes are largely dependent on ability, but to diverge from S-E in domains where outcomes are less dependent on ability. This offers a potential explanation for inconsistencies in previous predictions and findings.

Our second conclusion is that in the domain of scholastic achievement, perceptions of the degree to which outcomes are dependent on ability are powerful predictors of both intentions and behavioral outcomes. Students who scored higher on this measure had stronger intentions to achieve the specified grade and also tended to attain a higher grade than did students who scored lower on this measure. Perceptions of the extent to which outcomes are determined by own effort played a lesser role: They had no independent impact on intentions or behavior. The stronger relationship between S-E ratings and intentions could be regarded as consistent with findings reported by several other investigators. As noted earlier, Terry and her colleagues (Terry, 1993; Terry & O'Leary, 1995; White et al., 1994) found that S-E-but not PBC-was predictive of intentions. Similarly, Sparks et al. (1997) and Guthrie and Sparks (1997) found that a measure of perceived difficulty (which could be construed as similar to our measure of S-E) was more useful in predicting intentions than was a measure of perceived control. Finally, Armitage and Conner (1997, p. 9) found stronger relationships between S-E (defined as "confidence in one's ability to carry out a behavior") and intention than between perceived control over the behavior (defined as "extent to which people perceive control over ... external factors") and intention. In short, there is a reasonably consistent body of evidence suggesting that confidence in one's ability to carry out a behavior is more important as a predictor of behavioral intentions than are measures of other control-related constructs.

An exception to this conclusion is the McCaul et al. (1993) study referred to earlier. As noted then, the fact that these researchers found that a measure of PBC was a better predictor of intentions than was a measure of S-E can be accounted for in terms of the differential scope of the two measures. This study nevertheless suggests that one should be cautious before concluding that as far as the prediction (and, by implication, the understanding) of intentions is concerned, the most important control-related variable is S-E, or confidence in one's ability to carry out the behavior or to attain the behavioral goal. This will only be true, we suggest, where the behavior or goal in question is strongly influenced by ability. Our findings go further than those of other researchers in suggesting that S-E is also an important predictor of behavioral outcomes. This aspect of our findings appears to be inconsistent with the findings of Terry and her associates. As noted earlier, they found that S-E did not predict behavior independently of intentions, whereas PBC (i.e., external control) did. A similar pattern of findings was reported by McCaul et al. (1993). There is a lesser degree of inconsistency with the findings of Armitage and Conner (1997), in that S-E was not found by these authors to be an independent predictor of behavior—although this was also true of perceived control over behavior. Accounting for these inconsistencies in findings is difficult, given the variations in measurement and behavioral domains across the various studies. There is a clear need for a more coordinated approach to future research efforts, such that different teams of researchers either use the same battery of measures in order to examine different behavioral domains, or use different batteries of measures to examine the same behavioral domain.

The third objective of the study was to examine the degree to which the relation between past and future academic achievement is mediated by PBC, S-E, or both. Here the findings point to a straightforward conclusion: For none of the three courses was it the case that past academic attainment failed to add significantly to the prediction of future attainment, even after intentions, S-E, and perceived control had been taken into account. Indeed, the addition of past behavior to the regression equation reduced the beta weights for S-E (until that point the most powerful predictor of behavior) to non-significance for all but one of the courses. Even in the case of English, where future behavior was predicted jointly by past behavior and S-E, there was no evidence that the "effect" of past behavior on future behavior was mediated by S-E. There are at least two possible explanations for this lack of evidence of mediation. First, it may be that the measurement of S-E needs to be refined. Bandura (1997) argues that "efficacy beliefs should be measured against levels of challenge, rather than by a few indefinite items" (p. 127). Only a single level of challenge ("at least a 7") was used in the present research; it may be that assessing efficacy beliefs in relation to varying levels of challenge would have yielded a more refined measure that would have fully or partially mediated the relation between past and future behavior. Second, it may be that the behavioral domain involved (examination performance) is one that is so heavily determined by ability that an objective measure of ability, such as past attainment on the course concerned, will always be a better predictor than a subjective measure, such as S-E. Against this is evidence from research by Zimmerman, Bandura, and Martinez-Pons (1992) showing that prior achievement only influenced future grades indirectly, via parental goals for the student, which in turn influenced the student's own goals, which were codetermined by S-E beliefs. Future achievement was found to be a

joint function of students' S-E beliefs and own academic goals. Such findings suggest that the relation between past and future academic achievement can be accounted for in terms of psychological constructs, given appropriate measures.

A final point for discussion concerns our findings relating to attitudes toward behavior. As noted earlier, attitudes were inversely correlated with intentions. Students were asked to rate how good-bad, pleasant-unpleasant, uselessuseful, and unattractive-attractive, achieving at least a 7 on the upcoming exam would be. Although the mean scores reported in Table 1 show that on average students regarded achieving at least a 7 as something quite desirable, the more desirable they found this outcome, the *lower* were their intentions to achieve it. This seems paradoxical but is, we believe, readily explicable. Even though the behavioral outcome was specified in precisely the same way ("achieving at least a 7 in the upcoming examination") in the items measuring attitudes and those measuring intentions, it would appear that students focused on one facet of the question when making their attitude ratings; namely, the attainment of a 7 (i.e., *merely* a 7). When answering the intention items, however, they seem to have focused on a different facet (i.e., at least a 7). Although all students rated the outcome as desirable, those who were relatively more pleased with the outcome were those with lower past achievement in the course concerned, lower S-E, and lower grades in the examination. This pattern of correlations confirms our interpretation: The better students, that is, those with better past performance, higher S-E, and better examination grades, were the ones who were relatively less likely to evaluate the attainment of "at least a 7" positively. Just as with the assessment of S-E, with hindsight it might have been better to assess attitudes in relation to different levels of achievement. A more general lesson to be learned from this finding is that simply ensuring that all measures correspond with respect to the target behavior may not be sufficient to guarantee that the measures correspond with respect to the way in which they are psychologically construed. However, this departure from what would be regarded as standard findings in the field of attitude-behavior research has no bearing on what we regard as the two major conclusions to be drawn from the present study: First, measures of items assessing control perceptions are separable into S-E and perceived control components; second, S-E is a potent predictor of academic intentions and outcomes.

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