Person-Behavior Beliefs, Behavior-Outcome Beliefs, and Students' Use of Academic Resources: The Effects of Teaching in the University Setting

by

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A thesis presented to the University of Manitoba in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Psychology

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Abstract

Students' willingness to ask questions in class, consult with the teaching assistant, or use library materials represents effective use of academic resources. According to a help-seeking perspective, these actions are examples of coping strategies that students use in order to alleviate their perception of being unable to attain a goal (Rosen, 1983). How effectively students respond to their perceived inability is determined, in part, by the causes to which they attribute their problem (Ames, 1983). For example, attributions to low ability cause students to adopt coping strategies which inhibit effective resource use (Ames & Lau, 1982). On the other hand, attributions to lack of effort cause students to seek appropriate help for their problem (Peterson & Barrett, 1987). These research findings suggest that factors influencing students' attributions for academic problems can also affect their help-seeking, and hence their ability to achieve. Two teaching-related factors which can influence students' help-seeking are described below.

First, certain teaching behaviors have been shown to influence attribution processes in students. Research has shown that behaviors related to effective lecturing lead to elevated expectations of control over academic outcomes, which are reflected in the attributions students endorse (e.g. Perry & Dickens, 1984). Thus, under effective teaching conditions, students are more likely to view their academic difficulties as controllable and amenable to change. Accordingly, effective teaching should cause students to adopt better coping strategies, leading to more frequent use of appropriate help-sources. In comparison, ineffective teaching lowers perceptions of control and should therefore lead to ineffective coping.

Second, teaching practises which promote ego- versus task-involvement can influence whether students use ability or effort attributions for failure (Ames, 1983). Ego-

involvement causes students to evaluate their ability in terms of the performance of others, and to attribute their performance to ability. Thus, ego-involvement accentuates feelings of inadequacy in students who believe they are inferior to others, and encourages ineffective help-seeking in these students. However, task-involvement causes students to focus on skill development and analyze their performance in terms of effort rather than ability. Hence, task-involvement should produce effective help-seeking in all students.

A series of three studies was conducted to test these predictions. Studies 1 and 2 examined the influence of certain teaching behaviors on students' help-seeking. In Study 1, an effective teaching behavior, expressiveness, was manipulated during a 25-minute videotaped lecture presentation. The effect of expressiveness on students' willingness to consult with a teaching assistant or use library resource materials to complete an assignment was then assessed. In Study 2, ten Introductory Psychology instructors were rated by their students on five effective teaching behaviors. The relation between these ratings and students' attributions and help-seeking was then assessed. Finally, Study 3 examined students' effective and ineffective help-seeking under ego- or task-involved classroom conditions.

Study 1

The first study examined the effect of one particular teaching behavior on students' help-seeking. Using videotapes, students were exposed to lectures in which instructor expressiveness was systematically manipulated by increasing or decreasing amount of voice modulation, eye contact, physical movement, and humour. After viewing the lecture, low and high self-efficacy students were given the option of using an instrumental help-source (teaching assistant) and a self-help resource (supplementary library material) in order to complete a difficult take-home assignment based on the lecture. The design was

therefore a 2x2 factorial, combining expressiveness (low, high) and self-efficacy (low efficacy, high efficacy). It was expected that high expressiveness would produce more help-seeking than low expressiveness, but only in students with high self-efficacy beliefs. Results showed that students' use of the resources was not affected by self-efficacy beliefs or instructor expressiveness. These findings can be accounted for by a number of factors, including instrumentation, manipulation of teaching effectiveness, and characteristics of the help-source. Suggestions for further research using this paradigm are discussed.

Study 2

The second study assessed the degree to which various achievement-related teaching behaviors correlate with students' coping profiles. To test this relation, ten Introductory Psychology instructors were rated by their students on five specific teaching behaviors: clarity, expressiveness, interaction, task-orientation, and organization. Factor analyses showed that this procedure produced a similar factor structure to that achieved by independent ratings of behavioral frequencies. Canonical analyses demonstrated that teaching behaviors involving clarity, teacher-student interaction, and organization were associated with high instrumental help-seeking, high self-help, and a low degree of persisting unaided. Significantly, this relation occured only in students categorized as high self-efficacy. Supplementary analyses suggested that these teaching behaviors produced effective coping in students by influencing their efficacy-related achievement attributions.

Study 3

The final study examined the influence of ego- and task-involvement on help-seeking in students who differed in their efficacy beliefs. The design of the study was a self-efficacy (low, high) by help-source (instrumental, executive) by motivational set (ego-involved, task-involved) 2x2x2 factorial, with frequency of help-seeking, performance, and

performance attributions as dependent measures. After assessing their self-efficacy beliefs, students were asked to complete an Analytical Reasoning Task for which either instrumental or executive help was provided. Instrumental help involves teaching the help-seeker methods by which he or she can solve the problem independently. Executive help involves providing the solution on behalf of the help-seeker. Thus, instrumental help-seeking fosters skill acquisition and executive help-seeking inhibits skill acquisition.

As predicted, the results showed a complex relation between self-efficacy, type of help-source, and motivational set. Low self-efficacy students used the executive help-source more under ego-involved compared to task-involved conditions, whereas the executive help-seeking of high self-efficacy students was unaffected by motivational set. However, motivational set affected instrumental help-seeking the same for self-efficacy groups, with task-involvement producing more instrumental help-seeking than ego-involvement.

These findings have two important implications for university classrooms. First, under normal university classroom conditions (i.e. ego-involved), low self-efficacy students adopt a help-seeking style that can limit their ability to acquire skills. That is, they rely excessively on executive aid, and fail to use instrumental aid. Second, by encouraging task-involvement, teachers can cause students to analyze their performance in terms of effort, rather than ability. This attribution pattern can decrease executive help-seeking in low self-efficacy students, and increase instrumental help-seeking in low and high self-efficacy students.

Together, these studies demonstrate that specific instructional variables can influence students' academic help-seeking. First, by delivering lectures which are clear and organized, and by interacting with students before and after class, university teachers can encourage effective help-seeking in their students. Second, by adopting classroom procedures which encourage task-involvement, teachers can decrease inappropriate help-

seeking, and increase students' use of appropriate help-sources. These findings suggest that the teacher plays an important role in student cognitive processes: the teacher can affect how students analyze the causes for their performance, and therefore can influence classroom achievement behavior.

Person-Behavior Beliefs, Behavior-Outcome Beliefs, and Students' Use of Academic Resources: The Effects of Teaching in the University Setting

Literature Overview

The academic setting contains a potentially large number of resources which can enhance student learning and achievement. Some of these resources are institutionalized and are readily accessible to most students. Examples of these include study skills programs, tutoring programs, teaching assistants, and sub-freshman courses specifically designed to upgrade skills. Other resources are more informal, and can range from peer study groups to classroom discussions. In part, students' success in the academic setting depends on how effectively these resources are used. For example, students experiencing or anticipating difficulty may fail to meet with the teaching assistant, withdraw from class discussions, or seek inappropriate assistance. These students will be less successful than their peers who are effective users of academic resources. The present thesis uses the help-seeking literature to show how university teachers can encourage effective resource use in their students.

Research has shown a relation between help-seeking and the causal inferences made for problems. This research suggests that causal attributions perform an important role in how we become aware of our need for help, and how we perceive our problem. Hence, factors which influence the causal inference process may also be affecting the way we seek help. Within the classroom setting, the teacher can be identified as an important determinant of students' attributions. The effectiveness of teachers' lecture presentations and their methods of evaluation and feedback can affect whether students attribute their successes and failures to controllable or uncontrollable factors, to internal or external factors, and so on. Due to this potential effect, teachers may be influencing students' help-seeking. That

is, they may be influencing the frequency and quality of students' questions, whether students consult with their teaching assistant, read supplementary material, or attend study group sessions. Before describing the studies which examined teaching effectiveness in relation to help-seeking, this section presents a theoretical model of academic help-seeking.

Use of Resources and Help-seeking

Consulting with the teaching assistant, attending tutorials, and asking for clarification of lecture material can be viewed as help-seeking within the academic setting. This behavior in students should be considered separate from more general achievement strivings, such as studying, in that different cognitions are involved. Whereas studying is performed in order to obtain a goal, help-seeking occurs because the normal means of achieving a goal are perceived as inadequate. For example, a student may feel that no amount of studying is sufficient for passing a test. Because studying is a primary means of passing the test, and it is perceived as inadequate, the student may decide to access supplementary resources. For example, the student may employ a tutor to help develop particular skills or knowledge prior to an examination. Thus, by judiciously using available resources in his or her environment, the student has solved the problem of achieving an otherwise inaccessable goal.

As a result of the above argument, help-seeking is often viewed variously as a problem-solving strategy (Ames, 1983; Nelson-LeGall, Gumerman, & Scott-Jones, 1983) and as a coping strategy (Rosen, 1983). That is, one engages in help-seeking in order to solve the problem, or to cope with the inability to achieve a goal. Although a decision to seek help represents one method of solving the problem, other strategies are also available to the student. For example, he or she may decide to withdraw from the task (Dweck, 1975; Dweck & Licht, 1980), procrastinate (Rosen, 1983), or to continue working unaided (Peterson & Barrett, 1987; Rosen, 1983). Moreover, given that the student seeks

assistance, he or she may choose to use an inappropriate help-source which fails to develop the necessary skills (Nelson-LeGall, et al., 1983). Since only some of these alternatives lead to the desired goal they will be referred to as coping strategies, in accordance with Rosen (1983).

Employing a coping strategy is often conceptualized in terms of a two-stage process by help-seeking theorists (Gross & McMullen, 1983; Nelson-LeGall et al., 1983; Rosen, 1983). In the first stage, a problem becomes defined, and in the second stage, a strategy for coping with the problem is generated. One comprehensive examination of the problem definition stage is provided by Rosen's (1983) perceived inadequacy model. In his model, Rosen conceptualizes problem definition as the perception that one's resources to complete a task unaided are less than the resources required for the task. When this perception occurs, an individual may decide to seek help or to employ some other coping strategy (Rosen, 1983). After reviewing Rosen's approach to problem definition, the thesis will integrate this view with an attribution approach which allows for more precise predictions of students' help-seeking.

A Perceived Inadequacy Approach to Problem Definition

According to Rosen's model, problem definition involves the perception that one's existing resources are insufficient for attaining a particular goal. This perception results from a ratio involving two cognitions: the numerator is the perceived amount of resources required to complete a task unaided, and the denominator is one's perceived amount of resources currently available. As shown in Figure 1, the perception of inadequacy is characterized by the single dimension of magnitude which is related to help-seeking in a curvilinear manner. That is, as the ratio approaches unity, uncertainty about whether to seek help exists. However, as the size of the ratio exceeds 1.00, the probability of help-seeking ostensibly increases to some critical level, after which the probability diminishes. Rosen suggests that the magnitude of the inadequacy ratio is determined by four factors,

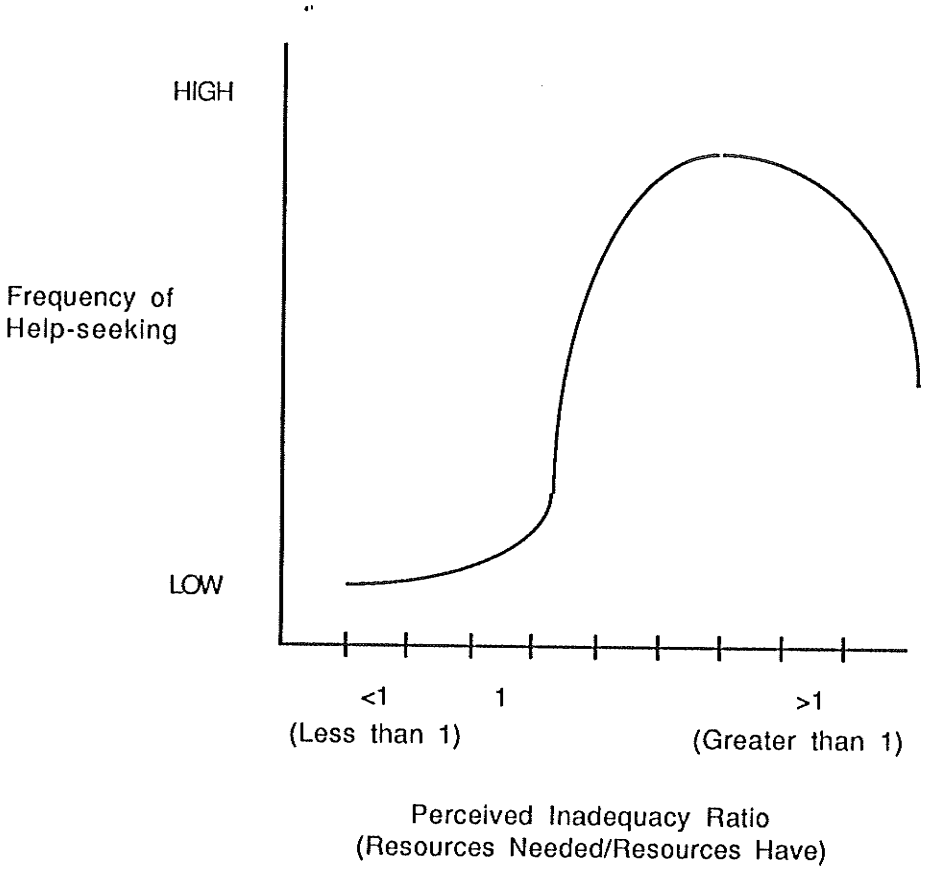

Figure 1: The curvilinear relation between Rosen's perceived inadequacy ratio and frequency of help-seeking is depicted.

including past successes and failures, observation of others' actions, evaluative feedback from others, and internal feedback derived from goal-directed action (Rosen, 1983).

If any one or combination of these factors elevates the magnitude of the ratio, then an attributional search to determine the cause of the inadequacy is initiated. As a result of ascribing the inadequacy to some cause, the individual will adopt one of several coping strategies which could range from denial (e.g. Perry & Magnusson, 1989) to help-seeking (e.g. Ames & Lau, 1982). However, this attribution-coping strategy relation is not adequately mapped out in Rosen's model. That is, given that an individual ascribes the inadequacy to some cause, the model does not predict whether he or she will adopt a help-seeking strategy or some other coping alternative. In fact, the model is not internally consistent in that Rosen predicts that help-seeking is curvilinearly related to the magnitude of the ratio, but also suggests that help-seeking is determined by specific attributions made by the individual.

Although the perceived inadequacy model is not without problems, the general notion that help-seeking is somehow related to one's perceived inability to achieve a goal appears reasonable. However, if the perceived inadequacy approach to problem definition is to be retained, more theoretical work is required. First, one may question whether the perception of inadequacy varies along only the dimension of magnitude. For example, empirical evidence suggests that in addition to severity, the generality of the problem is an important determinant of help-seeking (e.g. Robbins & Greenley, 1983). Similarly, the perception of inadequacy may be characterized by other dimensions (e.g. Bandura, 1977). Second,the revised model should relate specific attributions to choice of coping strategy. For example, the revised model described below shows how students' attributions for academic difficulties influence their style of help-seeking, as well as their willingness to engage in self-help, persist unaided, or give-up.

A Revised Model of Help-Seeking

The present model of help-seeking borrows liberally from the writings of Ames (1983), Nelson-LeGall et al. (1983), and Rosen (1983). First, in accordance with Ames (1983) and Nelson-LeGall et al. (1983), students who can effectively seek help are viewed as behaving functionally in the academic environment. This perspective differs from traditional help-seeking research which emphasizes the inadequacy of the help-seeker, and the dependency within the helper-recipient relationship. Second, the model acknowledges that students may adopt different styles of help-seeking, and uses Nelson-LeGall et al.'s (1983) distinction between executive and instrumental help-seeking. Finally, similar to Ames (1983), help-seeking and other coping strategies are related to students' attributions for academic outcomes. While Ames adopts a self-worth framework for examining the implications of different attribution styles, the present model focuses on attributions which reflect beliefs concerning relations between the student, his or her actions, and an outcome.

The present model is based on the distinction made by various control theorists between beliefs concerning person-behavior relations and behavior-outcome relations. In Bandura's (1977) model, these beliefs are respectively referred to as efficacy expectations and outcome expectations. Efficacy expectations concern the belief that a particular course of action can be successfully executed, and outcome expectations concern the belief that a given course of action will result in a particular outcome. While similar constructs have been suggested elsewhere (see Skinner, Chapman, & Baltes, 1988), Bandura's terminology is used in this study. The intention is not to adopt the entire self-efficacy theory, but rather to employ Bandura's distinction between efficacy and outcome expectations within a help-seeking perspective.

Problem definition. According to the model (see Figure 2), problem definition processes serve a self-regulatory function which allows students to align their actions in

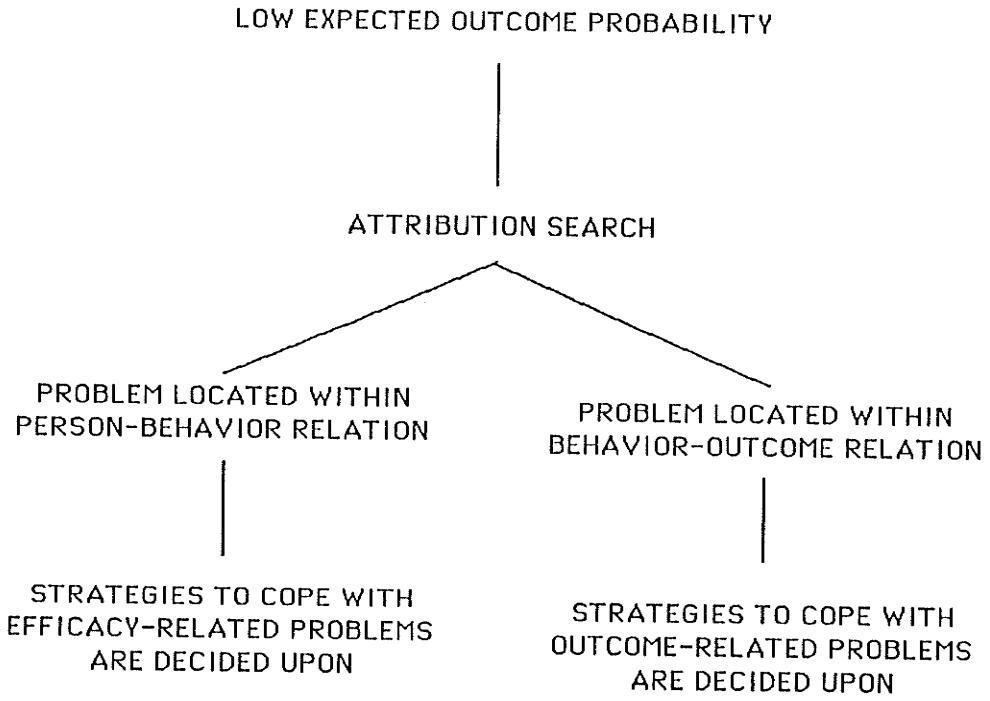

Figure 2: Problem definition processes are initiated by an expectation of low outcome probability. Depending on the outcome of an attribution search, the source of the problem is perceived as either efficacy-related or outcome-related, and strategies for coping with the problem are decided accordingly.

accordance with a final outcome. These processes are engaged by an expectation of low outcome probability which initiates an attribution search. For example, students who feel that they are unable to successfully complete an assignment (a low outcome probability) will ascribe their perceived difficulty to some cause, such as their lack of ability, the difficulty of the task, and so on. Depending on the perceived cause of their difficulty, students will select an appropriate course of action, such as seeking help, giving-up, or some other coping strategy.

According to Weiner's (1986) attribution theory, students routinely analyze the causes of achievement events in order to better understand their environment and to improve their ability to attain desired goals. He argues that these causal perceptions can be organized along three underlying dimensions, and the location of a cause within this space determines motivation and emotions. Using Weiner's (1979) attribution framework, each cause can be located along the dimensions of locus, stability, and controllability. In the present help-seeking model, each dimension has implications for how the student perceives his or her problem. By determining the locus of the attribution, one can assess whether the problem is perceived as efficacy-related or outcome-related. Figure 3 illustrates how internal versus external attributions respectively reflect efficacy (person-behavior) and outcome (behavior-outcome) beliefs. Moreover, the location of the attribution along the other dimensions, stability and controllability, qualifies these beliefs. For example, one can make two inferences from a low performance expectation ascribed to insufficient ability. First, because ability is an internal attribution, the perceived source of difficulty resides within the person-behavior relation, rather than the behavior-outcome relation (Abramson, Garber, & Seligman , 1980). Second, because ability is a stable, uncontrollable cause, the problem is perceived as severe, not easily changed, and is likely to affect performance on other tasks (see Abramson et al., 1980; Bandura, 1977). On the other hand, an attribution to an

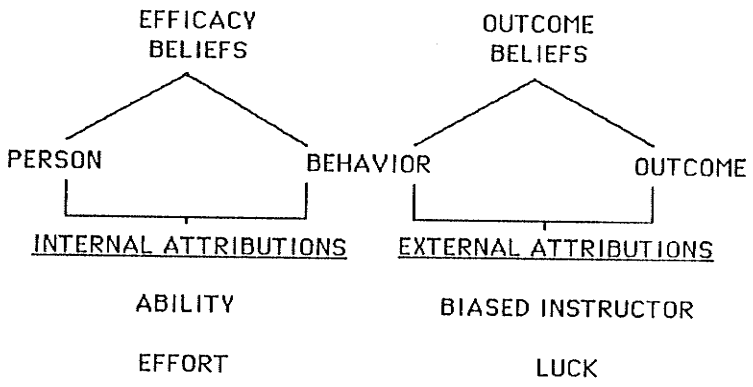

Figure 3: Attributing a problem to an internal or external cause reflects the person's beliefs concerning whether the cause is perceived as efficacy-related or outcome-related.

internal cause which is unstable and controllable has different implications for problem perception. Consequently, an attribution to lack of effort implies that the problem is not severe, can be easily changed, and will not likely affect performance on other tasks. The model further suggests that as a result of attributing the problem to lack of ability or lack of effort, students will adopt particular coping strategies.

Although internal attributions reflect on person-behavior beliefs, external attributions reflect on behavior-outcome beliefs (Abramson et al., 1980). Thus, attributing a low outcome probability to an unfair evaluator reflects the belief that no relation exists between one's performance and the associated outcome. Similar to internal attributions, the location of an external cause along other dimensions can qualify the outcome expectation. For example, a biased evaluation from a teaching assistant may be perceived as more changeable than a similar evaluation from a professor. Although external attributions theoretically differ in controllability, empirical evidence suggests that most external causes are perceived as uncontrollable (see Weiner, 1986). To the extent that a behavior-outcome problem is viewed as controllable, students are expected to choose a strategy which restores the behavior-outcome relation, such as enlisting the aid of a grade appeals committee. Problems attributed to uncontrollable external factors may lead to coping strategies such as giving-up.

Thus, based on Bandura's (1977) model, low outcome probabilities can result from two sets of cognitions, one which reflects person-behavior beliefs, and one which reflects behavior-outcome beliefs. One can infer whether the student locates the problem within the person-behavior relation by determining if he or she ascribes the difficulty to internal factors, such as ability or effort. On the other hand, attributions to external factors, such as the instructor or luck, reflect low outcome expectations. These factors to which students attribute their difficulty have implications for problem perception and hence for choice of coping strategy.

Efficacy-related attributions. The suggestion that internal attributions reflect beliefs concerning efficacy has been made previously. Abramson et al. (1980) argued that failure attributions to lack of ability imply a low efficacy-high outcome expectation, whereas external attributions imply low outcome expectations. Moreover, recent attribution retraining research has shown that university students (Perry & Penner, in press) and children (Schunk, 1981; 1982; 1983; 1984) taught to attribute success to ability and effort elevate their efficacy expectations. Finally, earlier attribution research suggests that failure attributions to lack of effort are associated with cognitions and behavior which also characterize high self-efficacy beliefs. For example, Dweck et al. (Dweck, 1975; Dweck & Licht, 1980; Dweck & Repucci, 1973) have shown that children who attribute failure to lack of effort have higher expectations for future success, and exhibit greater effort and persistence than students who attribute failure to lack of ability. This evidence compares with findings from self-efficacy research showing that high self-efficacy students expend greater effort on tasks, and exhibit more persistence than low self-efficacy students (Schunk, 1982).

The above findings suggest that internal attributions which differ in stability and controllability are related to students' self-efficacy beliefs. In particular, failure attributions to internal, stable, uncontrollable factors, such as insufficient ability, reflect low efficacy expectations, whereas failure attributions to internal, unstable, controllable factors, such as lack of effort, reflect relatively high efficacy expectations. With respect to Bandura's model, low ability attributions contribute to the perception that the problem is severe, unchangeable, and general. That is, a large discrepancy is perceived between current and desired level of performance; the discrepancy is perceived as not easily changed; and the discrepancy is expected to affect performance across a variety of tasks. Conversely, low effort attributions cause a problem to be perceived as less severe, easily changed, and low

in generality (see Abramson et al., 1980; Bandura, 1977). These ideas are developed in Table 1.

These differences in problem perception are expected to influence students' strategies for coping with academic difficulties. For instance, failure attributions to an uncontrollable factor such as low ability can cause students to believe that they are unable to improve their performance capabilites. They are, therefore, less likely to make effective use of academic resources designed to improve skills. On the other hand, a failure attribution to a controllable factor, such as lack of effort, can cause students to believe that their problem is easily corrected. These students will therefore be motivated to use resources designed to improve skills. Furthermore, attributions characterized by similar dimensional properties will have corresponding effects on coping strategies. For example, other internal, unstable, controllable attributions such as inappropriate strategies or lack of practise will likewise lead to skill enhancing coping strategies.

The coping strategies included in the present model (Table 1) are instrumental and executive help-seeking, self-help, persisting unaided, and giving-up. Of these, the strategies associated with skill development are instrumental help-seeking and self-help. Instrumental help-seeking involves learning the methods by which a problem can be solved, thereby allowing the help-seeker to retain responsibility for the solution to the problem. Self-help is similar to instrumental help-seeking in that the individual learns methods of problem solving and can therefore retain responsibility for the solution. The two strategies differ, however, in that instrumental help-seeking entails the intervention of a help-giver, whereas self-help does not. For example, a student may ask for instrumental aid of the teaching assistant in order to learn essay writing skills. The student may also engage in self-help by reading books on essay writing. Each of these strategies will result in the student learning general methods of essay writing, and will allow the student to successfully complete an essay on his or her own. Because instrumental help-seeking and

Table 1

An Attribution Model of Academic Help-Seeking

	Problem Perception	Coping Strategy
Efficacy Attributions		
Internal		
Stable, Uncontrollable		
Low Ability	Severe General Unchangeable	Executive Help-seeking Persisting Unaided Giving-up
Internal		
Unstable, Controllable		
Low Effort Lack of Practise Strategy	Not severe Specific Changeable	Instrumental Help-seeking Self-help
Outcome Attributions		
External,		
Uncontrollable		
Unfair Evaluation Biased Instructor Bad Luck	Unchangeable*	Executive help-seeking Persisting Unaided Giving-up

* In general, external causes are perceived as unchangeable, but exceptions can be cited.

self-help lead to skill acquisition and promote independence of the help-source, they are considered effective coping strategies.

The other strategies, executive help-seeking, persisting unaided, and giving-up, are less effective in that they inhibit skill aquisition. Executive help-seeking involves requesting the help-giver to solve the problem on behalf of the help-seeker. Continuing with the preceding example, a student may request executive aid of a teaching assistant by asking him or her to rewrite portions of an essay. Thus, rather than learn how to complete the task independently, the student relinquishes the responsibility of task completion to the help-giver. As suggested above, students may adopt this help-seeking style when they lack confidence in their ability to acquire the new skills. Therefore, rather than seek instrumental aid or engage in self-help, they request a help-giver to complete the task on their behalf. If an executive help-source can not be found, these students may elect to persist unaided or eventually give-up.

The use of effective or ineffective coping strategies for efficacy-related problems should be related to the type of internal attribution made by the student. Students who attribute their problem to unstable, controllable factors such as lack of effort or inappropriate strategies are confident of their ability to acquire new skills (Abramson et al., 1980; Dweck & Licht, 1980). They are therefore expected to engage in instrumental help-seeking and self-help in order to acquire the skills necessary to solve the problem on their own. On the other hand, students who attribute their problem to stable, uncontrollable factors, such as lack of ability, are less confident of their capacity to learn new skills. These students are therefore more likely to engage in executive help-seeking, persist unaided or give-up.

Empirical evidence supporting this analysis was provided by Magnusson and Perry (1989). They examined the success and failure attributions of students, along with their willingness to use a variety of coping strategies. Their data revealed a relation between

attributing success to ability and effort and the endorsement of instrumental help-seeking and self-help. These results suggested that students who are confident of their ability to perform well, as reflected by their success attributions to ability and effort (Schunk, 1984), are more likely to perceive performance-related problems as controllable. When they encounter academic difficulties, they therefore choose coping strategies which involve skill development. These strategies include instrumental help-seeking and self-help.

Further empirical support was provided by Ames and Lau (1982) and Peterson and Barrett (1987). Although these investigators did not differentiate between instrumental and executive help-seeking, a review of their studies reveals that their help-sources were associated with instrumental aid. For example, Ames and Lau (1983) studied attendance at pre-exam review sessions, and Peterson and Barrett (1987) studied the frequency with which students consulted with an academic advisor. Each of these studies revealed more frequent, instrumental, help-seeking by students who attributed their problems to lack of effort, compared to students who attributed their problems to lack of ability.

Outcome-related attributions. As suggested, students making external attributions for a low outcome probability locate the problem within the behavior-outcome relation, rather than the person-behavior relation. That is, they do not believe that their performance capabilities are responsible for their expected failure; rather, they believe that no relation exists between their performance and the outcome they receive (Abramson et al., 1980). This belief has logical implications for choice of coping strategy. First, students are not expected to engage in instrumental help-seeking or self-help because these strategies alleviate deficits in performance rather than restore the behavior-outcome relation. Second, students may engage in executive help-seeking, since this strategy leads to successful outcomes without requiring skill development. For example, the student may enlist the aid of a grade appeals committee to act on his or her behalf. Finally, if an executive help-

source is unavailable, the student may decide to enroll in a section taught by a different instructor, or simply give up and accept failure. In this respect, Magnusson and Perry (1989) provided empirical evidence to support this argument. They found that students who attributed failure to external factors were more likely to engage in executive help-seeking, persist unaided, or give-up. These results suggested that students characterized by external attributions generally choose coping strategies which do not involve skill development.

Changing Students' Coping Strategies

According to the revised help-seeking model (Table 1), students' coping strategies are determined by their attributions to academic difficulties. Thus, by altering their attributions, one can produce more effective help-seeking thereby enhancing students' academic achievement. Various technologies to effect attributional changes have been reported in the education literature. These include: (1) persuasion, in which the therapist/experimenter verbalizes the appropriate attribution for the subject (Dweck, 1975; Fowler & Peterson, 1981; Schunk, 1981; 1982; 1983; 1984); (2) reinforcement, in which operant techniques are used to increase appropriate attribution verbalizations (Andrews & Debus, 1978); (3) modeling, in which a stimulus person, often presented on videotape, verbalizes the appropriate attribution while performing on a task (Zoeller, Mahoney, & Weiner, 1983); (4) informational, in which the subject is educated about the importance of not viewing academic failure as a deficiency in ability (Perry & Penner, in press; Wilson & Linville, 1982; 1985).[1] Each of these techniques is a direct intervention in that they are specifically designed to alter students' attributions to effect certain behavioral changes.

In addition to these direct interventions, recent research suggests that certain classroom variables can succeed in influencing students' attributions. In this respect, teachers can

[1] This classification of attribution training techniques along with the review of literature is summarized in Weiner (1986) and in Foesterling (1985).

play an important role towards shaping attribution processes in students via their teaching behaviors (Magnusson & Perry, in press; Perry & Dickens, 1984; 1987; Perry & Magnusson, 1987; 1989; Perry, Magnusson, Parsonson, & Dickens, 1986; Perry & Penner, in press; Perry & Tunna, 1988); their evaluative feedback (Dweck & Licht, 1980); and their methods of classroom organization (Ames, 1983). Research related to each of these topics suggests that behaviors and practises which comprise effective teaching and classroom management are important determinants of students' attributions. However, little data is available concerning the effects of teacher-influenced attributions on student motivation and classroom behavior.

The model of help-seeking which has been presented here suggests that teacher variables that affect attribution processes may be influencing students' choice of coping strategies. Based on this model, three studies were conducted to examine how specific teacher variables can produce effective coping in students. Studies 1 and 2 introduce a model which relates effective lecturing behaviors to student attribution processes and help-seeking. According to the model, university teachers who exhibit behaviors related to effective teaching, such as expressiveness and organization, can produce an attribution profile which leads to effective help-seeking in students. Study 3 examines the effect of a variable which can be influenced by the teacher through various classroom organization and evaluation practises. This variable concerns the degree to which students are task-involved (processing task-relevant information and focusing on improvements over previous performance) versus ego-involved (processing social comparison information and focusing on one's performance relative to others). Ames (1983) has suggested that teachers who encourage task-involvement in their students foster attributions which are relevant for effective help-seeking. Study 3 extends Ames' (1983) argument and shows how task- versus ego-involvement can influence instrumental and executive help-seeking in the university classroom.

Study 1

Recent instructional research has shown that effective teaching behaviors can influence students' achievement attributions (e.g. Perry & Dickens, 1984). When teaching is effective, students can master the lecture material more easily (Perry, 1981), and they perceive greater control over their ability to achieve (Perry & Magnusson, 1987). Thus, students receiving high expressive instruction are more likely to attribute their higher achievement to their ability and effort, compared to students receiving low expressive instruction (Perry & Dickens, 1984). Further research suggests that the effects of high expressiveness can be undermined by students' perception that they lack control over their achievement. Hence, high expressive instruction does not improve the achievement or attributions of students who have been exposed to noncontingent feedback, or who have stable expectations of low control (Magnusson & Perry, in press; Perry & Penner, in press). Due to its effect on the attributions of some students, instructor expressiveness is likely to influence certain classroom behaviors such as help-seeking. That is, high expressiveness should produce more effective help-seeking compared to low expressiveness, but only in students having high expectations of control. The present study examined this issue by assessing the willingness of low and high self-efficacy students to consult with a teaching assistant and use library resource material after viewing a low or high expressive lecture.

Teaching Effectiveness and Student Learning Processes

The influence that effective teaching has on students' achievement and associated attributions has been described by Perry and his associates (Magnusson & Perry, in press; Perry, 1981; Perry & Magnusson, 1987; Perry & Magnusson, 1989; Perry & Tunna, 1988;). These researchers suggest that specific teaching behaviors increase achievement

due to their role in information processing. For example, behaviors associated with instructor expressiveness, such as voice intonation and physical movement, may enhance students' ability to selectively attend to the lecture material. Intuitively, one can imagine how voice intonation can be used by a speaker to highlight or accentuate key points in a lecture. Based on this observation, one can argue that other expressive behaviors, such as eye-contact and physical movement, may also serve to enhance selective attention in students. Thus, as students' ability to attend to key points in a lecture increases, they are better able to process information related to test material (Abrami, Leventhal, & Perry, 1982).

In addition to achievement, research indicates that effective instruction influences students' attributions. For instance, Perry and his associates (Magnusson & Perry, in press; Perry & Dickens, 1984; Perry & Magnusson, 1987; Perry et al., 1986; Perry & Tunna, 1988) have shown that students exposed to high expressive instruction emphasize the role of ability and effort as factors contributing to their performance, and deemphasize the role of test difficulty and luck. Students receiving low expressive instruction were not as likely to endorse this attribution pattern. According to Magnusson and Perry (in press), the effect that expressiveness has on attributions is due to students' greater capacity for information processing under high expressive conditions. As students engage in self-monitoring in order to regulate their lecture-viewing actions, they become aware of their enhanced ability to process lecture material. They therefore are more confident in their capacity to perform well on tests related to the lecture, and have higher expectations of control over their achievement outcomes. These control expectations are reflected in students' attribution profile in which ability and effort are perceived as determinants of successful performance.

The effect that instructor expressiveness has on students' attributions may extend to

other classroom behaviors. Extensive research has shown that attributions affect achievement motivation in students (Weiner, 1979; 1986), and are associated with students' self-efficacy beliefs (Schunk, 1981; 1982; 1983; 1984). Thus, students who attribute their successes to ability and effort are generally more confident of their ability to perform well (Schunk, 1983), and are generally more likely to engage in behaviors necessary for high achievement (Frieze, 1982; Weiner, 1979). Within the university setting, recent studies have successfully produced higher achievement in students by altering their attributions for failure and success outcomes (Magnusson & Perry, in press; Perry & Penner, in press; Wilson & Linville, 1982; Wilson & Linville, 1985). Further research has shown that attributions can influence students' academic help-seeking, such as attending review sessions (Ames & Lau, 1982), and consulting with academic advisors (Peterson & Barrett, 1987). Thus, teaching behaviors which affect these attributions in students should also influence help-seeking, producing more effective use of academic resources. Consistent with this hypothesis, Perry and Penner (in press) have found that high expressive instruction increased the use of study materials in students with stable expectations of low control.

Interfering with Effective Instruction: Low Perceived Control

Perry and his associates have shown that high expressive instruction is not effective in students characterized by low expectations of control. Students who have been exposed to response-outcome noncontingent feedback before viewing a lecture do not achieve more with a high expressive instructor as compared with a low expressive instructor (Perry & Dickens, 1984; Perry & Dickens, 1987; Perry & Magnusson, 1987; Perry et al, 1986; Perry & Tunna, 1988). Significantly, noncontingent feedback does not interfere with expressiveness effects in students highly motivated to maintain control over their environment, such as students characterized by internal locus of control (Magnusson &

Perry, in press) and Type A behavior pattern students (Perry & Tunna, 1988). Unlike external locus and Type B behavior pattern students, these students do not experience lowered control perceptions after exposure to noncontingent feedback, and therefore can still benefit from expressive instruction. Consistent with these findings, other studies have shown that noncontingent feedback interferes with expressiveness effects only when students' perceived control is lowered. Hence, noncontingent success does not lower control perceptions, and therefore does not limit the effects of expressiveness (Perry et al., 1986). Similarly, shorter exposures to noncontingent feedback do not interfere with expressiveness effects to the same degree as longer exposures (Perry & Dickens, 1987).

Based on the above findings, Perry and associates (Magnusson & Perry, in press; Perry & Magnusson, 1989; Perry & Penner, in press) have argued that students who are characterized by stable expectations of low control do not benefit from expressive instruction. They suggest that these students are characterized by similar deleterious cognitions which impede expressiveness effects in students who experience transient loss of control due to environmental events. [2] In support of this argument, Magnusson and Perry (in press) found that instructor expressiveness did not affect the achievement or associated attributions of students with external locus of control. However, when the control perceptions of external locus students were elevated using contingent feedback (Magnusson & Perry, in press; Perry & Penner, in press) or attribution retraining (Perry & Penner, in press), expressiveness effects on achievement and attributions were detected.

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[2] The manner in which cognitions associated with low perceived control interfere with expressiveness effects is described more fully in Magnusson and Perry (in press). They used Kuhl's (1985) model to argue that these cognitions disrupt students' ability to regulate their actions in terms of their goal of high achievement. One self-regulatory activity disrupted by these cognitions is selective attention, which enables students to actively filter-out information irrelevant to their goal. When students develop low perceived control they focus much of their attention on cognitions associated with impending failure, such as anxiety and low self-esteem. With their capacity for selective attention thus reduced, expressiveness is unable to enhance this activity in students, and the effectiveness of this teaching behavior is undermined.

Since expressiveness does not affect the attributions of students characterized by low perceived control, this teaching behavior will be ineffective in influencing help-seeking in these students. To test this hypothesis, students' attributions for academic outcomes were assessed by means of a questionnaire (Lefcourt, Von Baeyer, Ware, & Cox, 1979). Based on their ability and effort ratings for failure outcomes (see Perry & Penner, in press), students were categorized as low or high self-efficacy, where low self-efficacy is associated with low perceived control, and high self-efficacy is associated with high perceived control. This procedure is based on the conceptual analysis provided by Abramson et al. (1980), who argued that failure attributions to ability reflect low self-efficacy, while failure attributions to effort reflect high self-efficacy. Students then viewed a videotaped lecture which varied in expressiveness, and were asked to complete a difficult take-home assignment based on the lecture material. Before leaving, they were provided the option of consulting with a teaching assistant or using supplementary resource material available in the library. It was expected that expressiveness would increase help-seeking in high, but not low, self-efficacy students.

Method

Subjects

Subjects were 121 Introductory Psychology students from the University of Manitoba subject pool. Students volunteered by signing their names in a sign-up booklet, thereby committing themselves to a particular experimental session. Experimental conditions were randomly assigned to sessions. Students received credit toward their Introductory Psychology course for their research participation.

Materials

Videotapes. The videotaped lectures were twenty-five minutes in length, and contained material related to the topic of repression. The amount of content for the low and high expressive lectures were equated by choosing the "high content" tapes as described in Perry, Abrami, and Leventhal (1979) and Perry, Abrami, Leventhal, and Check (1979). Expressiveness was varied by manipulating the amount of physical movement, eye contact, voice inflexion, and humour exhibited by the lecturer. For each condition, the lecturer, a male college professor, role-played these behaviors such that their frequency increased in the high expressive condition and decreased in the low expressive condition.

Multidimensional-Multiattributional Causality Scale (MMCS). The MMCS, developed by Lefcourt et al. (1979), measures attributions in two domains, interpersonal and academic-intellectual. The academic subscale used in the present study consisted of 24 Likert-type items assessing university students' endorsement of ability, effort, context (teacher, test difficulty), and luck attributions for success (12 items) and failure (12 items) outcomes (see Appendix A). For each item, students indicated the extent to which they agreed (1=disagree, 5=agree) with various statements reflecting the above attributions. Each attribution was assessed by six items which were balanced for success and failure.

Students' academic self-efficacy beliefs were inferred using the ability and effort items from the failure subscale. Weiner (1979; 1986) and others (e.g. Dweck & Licht, 1980) have pointed out that students who attribute failure to ability (an uncontrollable, stable factor) rather than effort (a controllable, unstable factor) have low expectations for success in the future. Similarly, Abramson et al. (1980) suggest that attributing failure to ability reflects low self-efficacy whereas failure attributions to effort are associated with high self-efficacy. Thus, students were classified as low or high self-efficacy by subtracting their total ability attribution ratings from their total effort attribution ratings for failure outcomes,

resulting in a possible range of scores from -15 to +15 (Magnusson, Perry & Dickens, 1987; Perry & Penner, in press). Scores approximating -15 indicate that students attribute their failure to ability, but not to effort. Scores which approximate +15 indicate that effort is perceived as the primary determinant of failure, and ability is perceived as unimportant. Hence, higher values on this scale reflect higher efficacy beliefs, and therefore greater expectations of control over academic achievement. Further discussion using this technique can be found in Perry and Penner (in press).

Take-home assignment. The assignment was presented to students after viewing the videotaped lectures. It consisted of six essay questions (see Appendix B) designed to assess understanding of the theory covered by the lecture. For example, the first question asked "Differentiate repression from forgetting and from suppression". Similarly, the other five questions covered material related to the lecture topic of repression. Students were instructed that the assignment, which was to be handed in within one week, had to be completed satisfactorily in order to receive their experimental credit (see Appendix B).

Achievement attribution items. Five items assessed the effect of the lecture manipulation on students' achievement cognitions. Students rated on a ten-point scale how much they felt that ability, effort, assignment difficulty, effectiveness of the instructor, and luck will contribute to their performance on the take-home assignment (0=not at all, 9=completely).

Use-of-resources items. Students were told that a teaching assistant was available to help answer questions concerning their assignment, and that a package of resource material related to the lecture topic was available in the reference section of the library. They were asked to indicate on the response sheet whether they would like to make an appointment with the teaching assistant and whether they intend to pick-up the resource material. The three alternatives that were provided for the teaching assistant and the resource material

items were as follows: a) would like to make an appointment immediately, or a) intend to use the resource material as soon as possible; b) may make an appointment later, if necessary, or b) will pick-up the resource material only if I have difficulty; c) do not wish to meet with the teaching assistant, or c) do not intend to use the resource material. Including two levels of using resources as indicated in alternatives a and b allowed for the possibility that some students would like to try the assignment without assistance before consulting with the teaching assistant, or using the resource material.

Procedure

Groups of approximately 30 students were seated in a simulated college classroom. After being informed of their right to leave during any portion of the experiment, students were administered the MMCS. After all students had completed the MMCS, they were shown either the low or high expressive lecture, and told that they would be given a take-home assignment after the lecture. Following the lecture, students received the instructions and take-home assignment. The experimenter read the instructions with the students, and then read each question on the take-home assignment.

Students were then asked to complete a "Post-Lecture Questionnaire", which contained the attribution items. After all students had completed this questionnaire, they were asked to complete the "Resources Questionnaire" which assessed their willingness to meet with the teaching assistant and use the library reference materials. The instructions included with the take-home assignment indicated that by assessing ahead of time how many students wished to consult with the teaching assistant or use the resource material, the experimenter could ensure that everyone had an equal chance to use these resources. After all students completed their questionnaires, the experimenter explained that they do not actually have to complete the assignment in order to receive their participation credit. Students were told the full purpose of the study and had their questions answered.

Results

Self-efficacy

Students were classified as low or high self-efficacy using the procedure described in the Method section. That is, students' ability ratings on the MMCS were subtracted from their effort ratings, using the failure subscale. Using this procedure, the median score was +4. Students' scoring +3 or lower (n=50) were classified as low self-efficacy, and students scoring +4 or more (n=71) were classified as high self-efficacy.

Use of Resources

Students' responses to the Use-of-Resources items were analyzed using the Chi-square procedure. It was shown that expressiveness (df=2) had no effect on use of the teaching assistant, X^2=0.00, or use of library resource material, X^2=1.45 (see Table 2 for frequencies). Likwise, self-efficacy (df=2) had no effect on students' use of teaching assistant, X^2=2.20, or library resources, X^2=0.14 (see Table 3 for frequencies). Moreover, expressiveness did not exert a differential influence on students' use of resources depending on students' self-efficacy. For low self-efficacy, the Chi-square value (df=2) for the use-of-teaching assistant by expressiveness contingency table was X^2=0.26, and the use-of-library by expressiveness Chi-square value (df=2) was X^2=1.09 (see Table 4 for frequencies). The comparable values for high self-efficacy (df=2) were, for teaching assistant, X^2=0.47, and for library materials, X^2=0.49 (see Table 4 for frequencies). While significant Chi-square values were not expected for the low self-efficacy group, significant values were predicted for high self-efficacy students.

Table 2

Use of Teaching Assistant and Library Resources by Expressiveness

	Teaching Assistant			Library Resources		
Expressiveness	Yes	Maybe	No	Yes	Maybe	No
Low	50%	51%	51%	50%	48%	67%
High	50%	49%	49%	50%	52%	33%
(n)	(2)	(80)	(39)	(34)	(73)	(12)
	$X^2 = 0.00$; $p > .05$			$X^2 = 1.45$; $p > .05$		

Table 3

Use of Teaching Assistant and Library Resources by Self-Efficacy

	Teaching Assistant			Library Resources		
Self-Efficacy	Yes	Maybe	No	Yes	Maybe	No
Low	0%	39%	47%	44%	40%	42%
High	100%	61%	53%	56%	60%	58%
(n)	(2)	(80)	(38)	(34)	(72)	(12)
	$X^2 = 2.20$; $p > .05$			$X^2 = 0.14$; $p > .05$		

Table 4

Use of Resources by Expressiveness: Controlling for Self-Efficacy

A.) Low Self-efficacy

	Teaching Assistant			Library Resources		
Self-Efficacy	Yes	Maybe	No	Yes	Maybe	No
Low	0%	55%	43%	60%	55%	80%
High	0%	45%	57%	40%	45%	20%
(n)	(0)	(31)	(28)	(15)	(29)	(5)
	$X^2 = 0.26$; $p > .05$			$X^2 = 1.09$; $p > .05$		

B.) High Self-Efficay

	Teaching Assistant			Library Resources		
Self-Efficacy	Yes	Maybe	No	Yes	Maybe	No
Low	50%	49%	40%	42%	44%	57%
High	50%	51%	60%	58%	56%	43%
(n)	(2)	(49)	(20)	(19)	(43)	(7)
	$X^2 = 0.47$; $p > .05$			$X^2 = 0.49$; $p > .05$		

Post-Lecture Attribution Items

Although the expressiveness and self-efficacy variables did not influence the help-seeking of students, analyses were carried out to determine whether they influenced students' attributions in the predicted fashion. A self-efficacy (low, high) by expressiveness (low, high) 2x2 MANOVA revealed only a main effect for expressiveness, $F(5, 110)=3.66$, $p=.00$. In order to probe this effect, follow-up univariate F-tests with 1 and 114 degrees of freedom were performed in order to determine which attributions were influenced by the expressiveness manipulation: ability, $F=11.64$, $p=.00$, $MSe=4.69$; effort, $F=2.24$, $p=.14$, $MSe=4.50$; assignment difficulty, $F=0.10$, $p=.75$, $MSe=4.76$; teaching effectiveness, $F=4.16$, $p=.04$, $MSe=8.47$; luck, $F=0.38$, $p=.54$, $MSe=5.55$. Using $p \leq .05$ as a criterion for a significant effect, the preceding ANOVAS revealed that expressiveness influenced the ability and teaching effectiveness ratings of students. An examination of the means in Table 5 shows that high expressiveness produced higher ratings on the ability item ($M=4.72$) than low expressiveness ($M=3.32$). Also, low expressiveness produced higher ratings on the instructor effectiveness item ($M=5.93$) than high expressiveness ($M=4.81$). Thus, students who received high expressive instruction were more likely to claim that their ability was going to contribute to their performance on the take-home assignment and students receiving low expressive instruction were more likely to claim that instructor effectiveness (i.e. low effectiveness) was going to contribute to their performance. One can speculate that when instruction was poor, students were more likely to blame their lowered performance expectations on the low quality of teaching.

Although the univariate procedure described above determined which attributions contributed to a significant multivariate effect, it did not take into account the relation

Table 5

Attribution Items Means and Standard Deviations

	Low Expressive		High Expressive	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Ability				
M	3.43	3.22	4.55	4.90
s.d.	2.06	2.32	1.64	2.33
Effort				
M	5.21	4.94	5.80	5.55
s.d.	1.93	2.51	1.36	2.21
Task Difficulty				
M	4.96	4.63	4.90	4.95
s.d.	2.17	2.12	1.92	2.36
Teacher Effectiveness				
M	5.86	6.00	4.90	4.71
s.d.	3.09	3.15	2.38	2.81
Luck				
M	2.00	2.84	2.45	1.84
s.d.	2.19	2.69	2.50	2.07
n	28	32	20	38

between the attribution ratings. For example, it did not indicate whether ability and instructor effectiveness item share some variance. To determine how these attributions related to one another and with expressiveness, a discriminant function analysis was performed. The correlation coefficients and z-scores (in brackets) were as follows: ability, .78 (.93); effort .34 (.04); assignment difficulty .07 (-.23); teaching effectiveness -.47 (-.55); luck -.14 (-.14). This function is characterized by emphasis of ability and deemphasis of teaching effectiveness as factors determining performance on the take-home assignment. The group centroids show that students who viewed the high expressive lecture (M=.61) were more likely to endorse this pattern than students who viewed the low expressive lecture (M=-.22). Thus, students viewing the high expressive lecture were discounting the influence of instruction, and were claiming that ability was an important factor determining performance. Conversely, students viewing the low expressive lecture claimed that the effectiveness of their instructor was an important factor determining their performance, but that ability was less important.

Supplementary Analyses

The analyses described in this section examine whether students who used or did not use the resources could be differentiated according to their attributions for their expected assignment performance. Students' scores on the Use of Resources Questionnaire were used to form two separate independent variables: (1) use of teaching assistant (maybe, no), and (2) use of library material (yes, maybe, no). Using separate MANOVA's, the effects of each of these variables on students' attribution ratings (ability, effort, assignment difficulty, teaching effectiveness, and luck) were assessed. The use of teaching assistant variable had a significant effect on students' attribution ratings, F (5, 111) = 2.33, p = .05 (see Table 6 for means and standard deviations). When this effect was probed using a discriminant function analysis, the following correlation

Table 6

Attribution Items Means and Standard Deviations for Supplementary Analyses

	Consult Teaching Assistant		Use Library Materials		
	Maybe	No	Yes	Maybe	No
Ability					
M	4.33	3.41	3.55	4.50	2.58
s.d.	2.27	2.19	2.08	2.17	2.23
Effort					
M	5.55	4.85	5.30	5.56	4.08
s.d.	2.13	2.08	2.14	1.86	2.97
Task Difficulty					
M	5.06	4.41	5.27	4.90	3.58
s.d.	1.98	2.45	2.13	2.09	2.19
Teacher Effectiveness					
M	5.06	5.87	5.46	5.29	5.58
s.d.	2.95	2.87	2.87	2.88	3.55
Luck					
M	2.45	1.77	1.88	2.31	2.75
s.d.	2.35	2.37	2.36	2.24	3.08
n	78	39	33	72	12

coefficients and z-scores (in brackets) were found: ability, .61 (.44); effort, .49 (.28); difficulty, .45 (.31); teacher, -.41 (-.56); luck, .42 (.54). This function is characterized by an emphasis of ability, effort, assignment difficulty, and luck, and a deemphasis of teaching effectiveness.However, the variable most highly correlated with this function is ability. The group centroids show that students who indicated that they might consult with the teaching assistant, M=1.94, were higher on this function than students who indicated that they would not consult with the teaching assistant, M=1.25. These results suggest that students who indicated that they might meet with the teaching assistant were relatively more likely to believe that their ability was an important factor contributing to their performance. Moreover, they were more likely to acknowledge the contribution of effort, assignment difficulty, and luck, and to discount the contribution of teaching effectiveness, although these variables were not as highly correlated with the function.

Once again using the MANOVA procedure, the effect of students' willingness to use the library materials (yes, maybe, no) on students attributions (ability, effort, assignment difficulty, teaching, and luck) was assessed. Since this effect approached, but did not reach, significance, $F(10, 222) = 1.79$, $p = .06$, subsequent analyses were not carried out (see Table 6 for means and standard deviations).

Discussion

Although the results of the present study failed to support the major hypotheses, important information was obtained on several related issues. In particular, the study suggests various factors which may have contributed to the failure to reject the null hypotheses. These factors include: (1) the method by which help-seeking was measured; (2) manipulation of teaching effectiveness; and (3) types of help-sources available to students. An examination of each of these factors suggests that minor modifications to the basic paradigm may lead to a pattern of findings more consistent with the predictions.

Measurement of help-seeking

In the present study, students' willingness to use the resources was assessed by having them designate themselves to "yes", "maybe", and "no" groups. By indicating "yes", students committed themselves to consulting with the teaching assistant, or borrowing the reference material from the library. One of the unexpected results was that only two students committed themselves to an appointment with the teaching assistant. The majority of students did not commit themselves one way or the other perhaps because they were provided with the option of deciding at a later time whether they wished to meet with the teaching assistant. Allowing students this option may have contributed to the small number of "yes" students. An alternative method would be to have students complete the assignment over a period of two hours during the experimental session, and allow them access to a teaching assistant and reference material. This procedure would provide a behavioral measure of help-seeking as well as a performance measure.

Manipulation of Teaching Effectiveness

The teaching behavior manipulated in the present study was expressiveness. However, in order to influence help-seeking, inclusion of other behavior variables may be necessary. For instance, Study 2 examines four other effective teaching behaviors in addition to expressiveness, including lecture clarity, teacher-student interaction, task-orientation, and organization. Perhaps effectiveness may need to be varied along each of these dimensions before an effect on help-seeking is produced.

Type of Help Source

In the present study, students' use of instrumental (teaching assistant) and self-help (library) resources was examined in relation to instructor expressiveness. It was expected that expressiveness would act on students' efficacy beliefs, with high expressiveness elevating, and low expressiveness diminishing, these beliefs. However, the attribution

findings suggest that although high expressive teaching increases students' self-efficacy, low expressive teaching does not diminish these beliefs. Rather, as a result of a self-serving bias phenomenon, students receiving low expressive instruction attributed their poor performance to their instructors' incompetence. Since their performance is not attributed to their skill level, they are not likely to choose a help-source which focuses on skill development. However, they may use an executive resource, which will lead to successful task completion, thus compensating for the effects of poor instruction without expending effort toward skill acquisition. This explanation suggests that in order to maximally differentiate between effective and ineffective use of resources produced by quality of instruction, both instrumental and executive resources should be included in the study. In accordance with the above explanation, high expressive teaching should increase instrumental help-seeking, and low expressive teaching should increase executive help-seeking. However, this explanation is speculative since a performance measure was unavailable.

Further research is required to evaluate the role of teaching effectiveness on students' efficacy and outcome beliefs, and how these are related to use of academic resources. The evidence from the present study suggests that particular teaching behaviors may influence these beliefs, but in accordance with a more complex model than initially put forward. Although the present study failed to produce findings showing a relation between expressiveness and use of resources, a replication which incorporates the modifications discussed earlier may yield results which are consistent with the predictions. Moreover, this topic should be pursued within a field design by having teaching assistants and instructors record questions asked by students during the course. This information could be supplemented by registration records of students enrolled in study skills courses and campus tutoring services, as well as self-reports on use of informal resources such as study groups.

Study 2

The previous study examined the influence of effective teaching on help-seeking by experimentally manipulating instructor expressiveness. However, effective teaching can be defined in terms of behaviors other than expressiveness, including organization, clarity, lecture content, interaction with students, and task-orientation (Feldman, 1976; Murray, 1983; Perry et al., 1986; Sullivan & Skanes, 1974). Similar to expressiveness, these behaviors may be influencing student learning processes (Perry & Magnusson, 1987; Perry & Tunna, 1988), thereby affecting attributions and efficacy beliefs. Thus, under effective teaching conditions, students attain high levels of achievement and feel more in control of their academic outcomes. They are therefore more likely to view academic difficulties as amenable to change, and will adopt more effective coping strategies, such as instrumental help-seeking and self-help. The present study examined this issue by assessing university teachers on five effective teaching behaviors, and determining whether these ratings were associated with coping strategies used by their students.

Effective Teaching and Student Attributions

The effect that expressive teaching has on students' learning has been described in the previous study. Perry and his associates (Magnusson & Perry, in press; Perry & Magnusson, 1987; Perry & Tunna, 1988) have argued that other teaching behaviors may be effective due to their influence on information processing activities. For example, behaviors associated with instructor organization, such as providing a lecture outline, may provide students with "chunking" strategies which improve longterm memory. Instructors who interact with students by praising them and encouraging participation may reduce state-associated cognitions (Kuhl, 1985), such as performance anxiety, which interfere with information processing. Likewise, other teaching behaviors, such as clarity and task-orientation, may be capable of enhancing achievement due to their effect at various stages

of information processing (Murray, 1983).

If, like expressiveness, other effective teaching behaviors enhance students' ability to achieve, then these behaviors should also influence students' attribution processes. Using the argument described in Magnusson and Perry (in press), students become aware of their capacity for high achievement under effective teaching conditions as a result of self-monitoring. Their model assumes that students regulate their lecture-viewing actions with respect to the goal of performing well on tests and assignments related to the lecture. Thus, when self-monitoring reveals that the lecture material is not being understood, students will alter their actions accordingly. They may concentrate more, organize their notes differently, or create mnemonics for themselves. Under effective teaching conditions, self-monitoring will cause students to become aware of their high capacity for achievement, and students will therefore perceive greater control over their ability to perform well.

As described in Study 1, these cognitions are related to high efficacy beliefs (Schunk, 1984) and will be reflected in the attributions students use to explain their performance. Hence, consistent with Perry and his associates (e.g. Perry & Dickens, 1984), effective teaching should cause students to emphasize ability and effort as factors contributing to their high achievement. Moreover, when students encounter academic difficulty, their elevated efficacy beliefs should cause them to view their problem as easily changed. They will therefore adopt effective coping strategies, such as instrumental help-seeking and self-help. However, ineffective teaching should lower efficacy beliefs, causing students to adopt less effective coping strategies when they experience difficulty.

Defining and Evaluating Effective Teaching

The evaluation of effective college teaching has been debated extensively in the higher education literature (e.g. Knapper, 1981). As a result of this discussion, researchers have converged on a number a global traits considered to be essential for effective teaching:

clarity, expressiveness, interaction, task-orientation, among others. These attributes were derived on the basis of: their influence on student achievement (Abrami, et al., 1982; Sullivan & Skanes, 1974); studies examining students' descriptions of ideal teachers (Feldman, 1976); and factor analytic studies of student rating forms (see Kulik & McKeachie, 1975). Although these traits appear to be valid indicators of effective teaching in terms of their influence on student achievement (Abrami et al., 1982; Sullivan & Skanes, 1974), and student ratings (Murray, 1983; 1985), they provide little information concerning specific behaviors of teachers (Murray, 1983).

Murray (1983) has argued that these "high inference" global traits can be understood in terms of specific "low inference" behaviors, which can be directly observed. Using the example from Study 1, expressiveness can be defined in terms of the frequency with which physical movement, eye-contact, voice modulation, and humor occur (Perry, Abrami, & Leventhal, 1979). Thus, teachers in whom these low inference behaviors occur infrequently are perceived as less expressive by students, compared to teachers in whom these behaviors occur frequently (Erdle & Murray, 1986; Murray, 1983; 1985). Similarly, other categories of teaching behaviors, such as clarity and organization, can be defined in terms of a limited number of low inference behaviors.

Based on the above argument, Murray (1983) developed the Teacher Behaviors Inventory (TBI), which consists of 60 items[3], each corresponding to a low inference behavior. The items were classified according to eight categories of teaching behaviors: speech, nonverbal behavior, explanation, organization, interest, task orientation, rapport, and participation. Some of the items in the participation category, for example, include: "encourages questions and comments"; "asks questions of individual students"; "asks

[3] Other versions of the TBI have been reported by Murray, including a 100-item (Murray, 1985) and a 95-item (Erdle & Murray, 1986) version. The 60-item version was chosen because a complete version, along with factor analyses, has been published by Murray (1983).

questions of class as whole"; and so on. Using the TBI, observers trained in the use of the instrument can record the frequency with which various behaviors occur during lectures (1=almost never, 5=almost always). At least two research findings attest to the validity of this approach. First, Murray has shown that ineffective teachers can be trained in these specific behaviors, thereby increasing their ratings (Murray, 1985; Murray & Lawrence, 1980). Second, teachers consistently rated as low, medium, or high in overall effectiveness by their students received significantly different ratings on most of the TBI items (Murray, 1983). Thus, TBI ratings corresponded with students' perceptions of overall effectiveness.

The present study used a modified version of the TBI which was developed based on factor analytical results reported by Murray (1983). In his study, 54 university teachers were observed over three separate 1-hour class periods, and the frequency of each of the 60 behaviors was assessed by 6 to 8 trained observers. Of the 60 items, 57 were judged to have sufficiently high inter-rater reliabilities (coefficients ranging from .51 to .97) to be included in a factor analysis. The factor analysis produced nine factors with eigenvalues of 2.0 or greater. These factors were easily interpretted in terms of the following teaching behavior categories, listed in order of variance accounted for: clarity, enthusiasm (i.e. expressiveness), interaction, task orientation, rapport, organization, use-of-media, pacing, and speech.

Based on the above results, items from five factors were chosen for inclusion in the present study: clarity, expressiveness, interaction, task-orientation, and organization. These categories were chosen in accordance with previous research indicating that these behaviors are effective in increasing achievement in students. In a brief review of this research, Murray (1983) points out that clarity and expressiveness have been shown to correlate with both student ratings and student achievement (Abrami et al., 1982; Murray,

1983; Rosenshine & Fürst, 1971). Other research has shown a relation between achievement and behaviors which correspond to the task orientation and organization factors (Rosenshine, 1979). Finally, teaching behaviors which comprise the interaction factor have been found to foster critical thinking skills in students (Smith, 1977). Thus, these behaviors appear to affect student learning processes, and should therefore influence students' help-seeking in accordance with the model presented earlier.

To test this hypothesis, students were asked to assess the frequency with which their professors in Introductory Psychology exhibited behaviors related to clarity, expressiveness, interaction, task orientation, and organization (0=never, 4=very often). The relation between these ratings and students' use of various coping strategies (executive help-seeking, instrumental help-seeking, self-help, persisting unaided, and giving-up) was assessed. It was expected that high ratings on the teaching behaviors would be positively associated with instrumental help-seeking and self-help, and negatively associated with executive help-seeking, persisting unaided, and giving-up.

Method

Subjects

Subjects were male and female students from ten sections of Introductory Psychology at the University of Manitoba. Each section was taught by a different instructor, with nine sections taught by males and one section taught by a female. The enrollments in each section varied from approximately 60 students to over 200 students. Each section had teaching assistants assigned in accordance with the size of enrollments. All ten sections were taught in a lecture format. Students volunteered by signing their names in a sign-up booklet during their Introductory Psychology class. Each booklet had spaces for 28 subjects to sign-up. The number of students from each section who completed the

experiment ranged from 19 to 28. Subjects were run in groups of two sections so that each experimental session had approximately 50 students.

Materials

Instructor Rating Scale (IRS). The IRS consisted of 39 items derived from Murray's (1983) Teacher Behaviors Inventory (TBI). As reported previously, the items chosen for the IRS correspond to those which loaded on to five achievement-related factors reported by Murray (1983): clarity, expressiveness, interaction, task orientation, and organization. Since Murray reported only those items with a factor loading of .50 or greater, this cut-off point was chosen as a criterion for including a particular item on the IRS. For each item, students were asked to rate on a five-point scale the frequency with which that particular behavior occurs in their introductory psychology lectures (0=never, 4=very often). A five-point scale was chosen based on previous instruction evaluation research in which 5-point Likert-type scales are typically used (e.g. Marsh, 1983; Murray, 1983; Sullivan & Skanes, 1974). (See Appendix C for a copy of the questionnaire.)

Attribution items. In order to assess the effect of the five teaching behaviors on performance and attributions, students were asked to report the letter grade they received on their most recent psychology test. The purpose of this item was to initiate attribution processes in order to determine the factors to which students ascribed their outcomes. They were then asked to rate on a ten-point scale the extent to which ability, effort, test difficulty, and luck contributed to their performance (0=not at all, 9=completely). The format of the attribution questionnaires was based on Perry and Dickens (1984).

Coping strategies. Students' use of various coping strategies was assessed by means of a 15-item questionnaire. Students were asked to imagine a situation in which they were experiencing considerable difficulty completing an important assignment for their Introductory Psychology course. They were then asked to rate on a 5-point scale how

likely they were to engage in various coping strategies. The questionnaire consisted of four executive help-seeking items, four instrumental help-seeking items, two self-help items, one item relating to persisting without seeking help, and two items concerning giving-up. An example of an executive help-seeking item is "How likely are you to ask the teaching assistant for the answer to one of the problems?", and an example of an instrumental help-seeking item is "How likely are you to consult with the teaching assistant to understand or clarify course material?". Similarly, other items refer to various academic resources available to the student (see Appendix D).

MMCS. Students' generalized self-efficacy beliefs were measured using the Multidimensional-Multiattributional Causality Scale (Lefcourt et al., 1979). The MMCS and the procedure used to assess self-efficacy beliefs have already been described in Study 1.

Procedure

Approximately 50 students were assigned to each experimetal session. After seating themselves, students were informed of their right to discontinue the experiment in the event that any part of it made them feel uncomfortable. They were also reminded of their responsibility to respond as honestly as possible to each item. The questionnaires, IBM response sheets, and pencils were then handed out. Before filling out their questionnaires, the experimenter referred students to the instructions at the beginning of each section. After the instructions for each section were read to the students by the experimenter, the students were permitted to begin. The various sections were administered in the following order in all questionnaires: MMCS, IRS, Coping Strategies, Attribution Items. After all students had completed their questionnaires, the purpose of the study was explained to them. When their questions had been answered, they received an experimental credit for participating in the study.

Results

Factor Analysis of the Instructor Rating Scale (IRS)

Because the IRS was derived from Murray's (1983) Teacher Behaviors Inventory (TBI), the factor structure was analysed in order to assess the degree to which it corresponded with the original inventory. The items used in the IRS were based on Murray's factor analysis of 57 TBI items, resulting in 39 questions, corresponding to five teaching behavior variables. The results of a varimax-rotated principle component analysis (PCA) revealed that a similar structure was achieved for student-rated instructor behaviors (IRS) compared to independently judged assessments of behavior frequencies (TBI).

The analysis yielded four factors with eigenvalues equal to 2.00 or greater (see Table 7). The scree plot (refer to Figure 4) shows that after four or five factors, the eigenvalues become similar. Further, examination of the factor loadings shows that the structure meets several of Thurstone's (1947) criteria for simple structure: (1) each row contains at least one near-zero loading; (2) each column contains several (between 11 and 22) near-zero loadings; (3) pairs of columns contain loadings which are near-zero in one but not the other column; (4) each pair of columns has only a small number of variables which have nonzero loadings in both columns (Harris, 1975). Moreover, the first four factors each contain loadings which correspond to four of the five original teaching behavior variables (clarity, expressiveness, interaction, and organization).

Table 7

First Five Factors of the IRS Factor Structure Matrix

			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q25	Use concrete examples	(c)	-.06	.03	.10	.03	.73
Q26	Give multiple examples	(c)	.18	.15	.03	.00	.81
Q27	Repeat difficult ideas	(c)	.20	.20	.44	-.09	.53
Q28	Ask questions of class of whole	(c,i)	.07	.78	.01	-.14	.10
Q29	Suggest practical applications	(c)	.11	.42	.21	.08	.23
Q30	Use graphs and diagrams	(c)	-.01	.04	.23	.10	.04
Q31	Stress important points	(c)	.15	-.08	.69	-.03	.20
Q32	Suggest Mnemonics	(c)	.33	.13	.56	.25	.09
Q33	Show interest in subject	(c)	.24	.07	.41	-.08	.03
Q34	Fail to take initiative*	(c)	.22	.09	.11	.09	.17
Q35	Show concern for students	(c)	.33	.30	.51	.16	.01
Q36	Use humour	(e)	.67	.17	.13	-.11	.17
Q37	Speak expressively	(e)	.74	-.01	.16	.07	.13
Q38	Show facial expressions	(e)	.71	.10	.27	.07	.13
Q39	Move about while lecturing	(e)	.35	.37	-.04	-.08	-.04
Q40	Read lecture verbatim from notes*	(e)	.03	-.09	-.01	.03	.04
Q41	Show energy and excitement	(e)	.81	.22	.15	.02	-.04
Q42	Smile or laugh	(e)	.78	.28	.07	-.07	.23

Table 7 (continued)

			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q43	Gesture with Hand or arms	(e)	.58	.16	.07	.11	.17
Q44	Avoid eye-contact with students*	(e)	.15	.21	.04	.01	.11
Q45	Speak Softly*	(e)	.56	-.10	-.06	.00	.01
Q46	Ask questions of individuals	(i)	-.13	.35	.12	.15	.01
Q47	Address students by name	(i)	.18	.16	.30	.22	.08
Q48	Provide opportunity for participation	(i)	.14	.70	.09	.07	.03
Q49	Encourage questions and comments	(i)	.26	.73	.05	-.04	.15
Q50	Praise students for good ideas	(i)	.30	.64	.02	.20	.01
Q51	Present thought provoking ideas	(i)	.27	.42	.44	-.03	.24
Q52	Talk with students after class	(i)	.48	.30	.23	-.01	-.16
Q53	Speak in monotone*	(i)	.64	.12	-.07	.05	.02
Q54	Digress from topic of lecture*	(t)	-.11	.11	.18	.07	.04
Q55	Proceed at a rapid pace	(t)	-.05	-.09	-.13	.16	-.15
Q56	Dwell on obvious points*	(t)	.22	-.01	-.22	.19	.02
Q57	signal transition to new topics	(t)	-.03	.24	.30	.27	-.01
Q58	advise students regarding tests	(t)	.09	-.01	.61	.31	-.01
Q59	Use headings and subheadings	(t)	-.08	-.11	.27	.65	.08

Table 7 (continued)

			Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Q60	Give overview of lecture	(o)	.06	-.04	.11	.83	-.10
Q61	Explain how each topic fits in	(o)	.07	.27	.37	.35	.26
Q62	State teaching objectives	(o)	.10	.15	.33	.56	.07
Q63	put outline of lectures on board	(o)	.03	.08	-.18	.79	.00
Eigen values			8.23	3.20	2.52	2.14	1.62
(% Variance)			(21.2)	(8.2)	(6.5)	(5.5)	(4.2)

*Coefficients reflect scale recoded to a positive direction

c=clarity

e=expressiveness

i=interaction

t=task orientation

o=organization

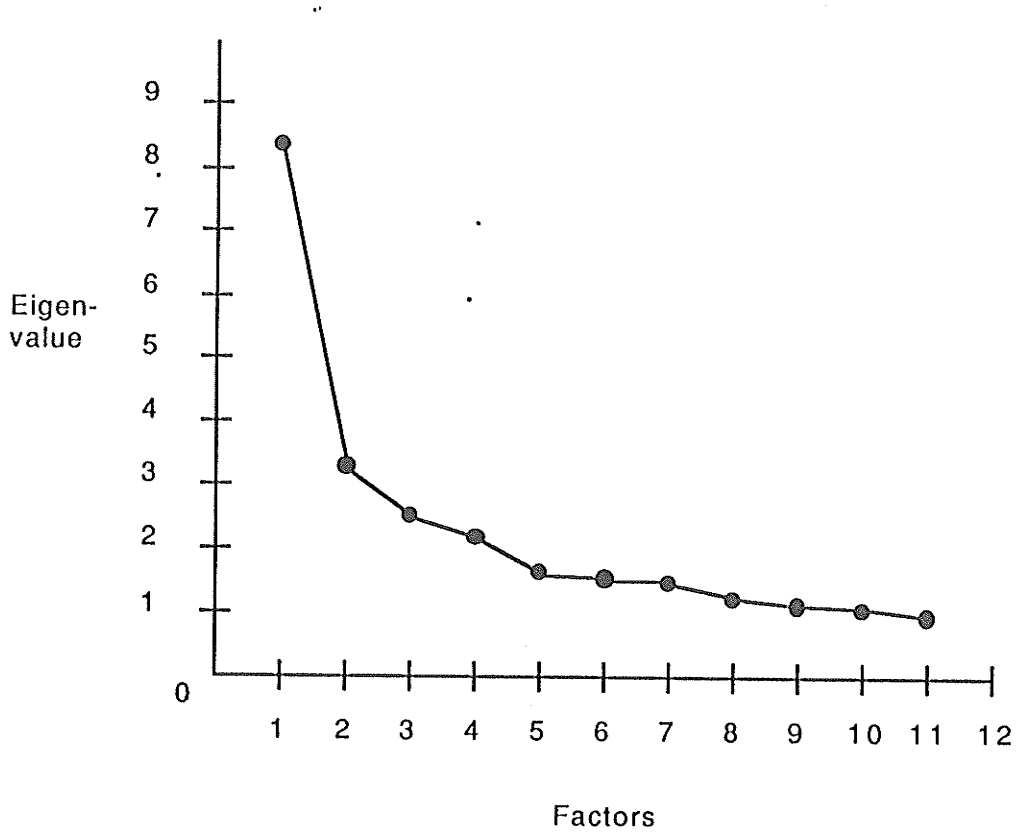

Figure 4: Scree plot showing the eigenvalues of the IRS factor structure.

By examining factor loadings in Table 7 which have a value of 0.5 or greater (underscored) , one can interpret each of the factors in terms of the following teaching behaviors: factor one (eigenvalue=8.27) corresponds to expressiveness; factor two (eigenvalue=3.20), interaction; factor three (eigenvalue=2.52), clarity; factor four (eigenvalue=2.14), organization. Note that the fifth factor (eigenvalue=1.62) also corresponds to the original clarity variable, but that it loads onto different items (uses concrete examples, gives multiple examples, repeats difficult ideas) than factor three (stresses important points, suggests mnemonics, shows concern for students, advises students regarding tests).

Although the fifth factor has associated with it only 4.2% of the factor variance, including it as part of the factor structure suggests that the original instructor clarity variable may consist of two components. As represented by the fifth factor, one component may be interpreted as clarity related to lecture content (using examples, repetitions), while the other component, as represented by the third factor, may be interpretted as imparting useful strategies (mnemonics, test information, signalling important lecture points). While the first component involves imparting lecture content information, the second component involves imparting information useful for high achievement. In accordance with this interpretation, this latter component also includes an item associated with teacher-student interaction, namely that of showing concern for students.

Although task-orientation appears not to be represented in the factor structure presented in Table 7, the seventh factor (eigenvalue=1.42) loads onto three items, each of which are associated with this variable: proceeds at a rapid pace (-.69), dwells on obvious points (.51), signals transition to new topics (.56). However, since this factor is associated with only 3.6% of the factor structure variance, its contribution to the overall structure is relatively unimportant. On the other hand, the first four factors account for 21.2%, 8.2%,

6.5%, and 5.5%, respectively, accounting for a total of 41.4% of the factor structure variance.

The analysis demonstrates that student ratings of low-inference instructor behaviors are characterized by a similar factor structure compared to independent assessments of behavioral frequencies. In each case, a relatively large number of low-inference behaviors map onto a small number of behavioral dimensions. In the present study, these ratings can be organized along four underlying dimensions which are interpreted as expressiveness, interaction, clarity, and organization. These results compare favorably with Murray (1983), with the exception that Murray consistently achieves a "task orientation" factor which is associated with a sufficiently large amount of variance to be retained as part of the factor structure. This difference between the independent assessments of Murray's studies, and the student ratings of the present study is clarified by examining evidence regarding student ratings of teaching effectiveness. This evidence demonstrates that there is no relationship between TBI ratings of task orientation items and student ratings of overall teaching effectiveness (Murray, 1983; 1985). Thus, this variable appears not to influence students during impression formation, and therefore may not be reliably rated by them. The small degree of variance associated with the task-orientation factor in the present study supports this interpretation.

The largest amount of variance in the present study is accounted for by an expressiveness factor (uses humour, speaks emphatically, shows energy, smiles or laughs, avoids eye-contact, and speaks softly). This result corresponds to Murray's (1983; Erdle & Murrary, 1986) factor analyses of TBI items in which 'enthusiasm' or expressiveness accounts for a large degree of the factor structure variance. It is also consistent with evidence demonstrating a relation between expressiveness and student ratings of instructor effectiveness (Perry, Abrami, & Leventhal, 1979; Perry, Abrami, Leventhal, & Check,

1979), and between expressiveness and student achievement (Abrami, Leventhal, & Perry, 1982). In accordance with Perry and Magnusson (1987), expressiveness may be a salient instruction variable because of its influence on attention processes during information processing. The effect of other less salient variables may not occur when expressiveness fails to activate attention processes which cause students to attend to the lecture in the first place (Murray, 1983).

Instructor Behaviors and Student Ratings: Covarying Efficacy

The purpose of this analysis was to determine whether instructors influenced ratings of their teaching behaviors after the influence of students' self-efficacy had been statistically controlled. If variability in IRS scores can be accounted for entirely by self-efficacy, then any relation found between IRS ratings and coping may be interpreted as mediated by self-efficacy rather than quality of teaching. However, if different instructors produce significant differences in IRS ratings after self-efficacy is controlled, then the relation between IRS ratings and coping may be more easily interpreted. A one-way Multivariate Analysis of Covariance (MANCOVA) was performed on students' collapsed ratings of their instructor's clarity, expressiveness, interaction, task orientation, and organization. The independent variable was instructor (10 levels) and the covariate was students' ability minus effort scores from the failure subscale of the MMCS. Results showed no effect for the covariate, $F(5, 219)=1.38$, $p=.23$ (s=1, m=1 1/2, n=108 1/2), but a significant effect for instructor, $F(45, 1115)=13.16$, $p=.00$ (s=5, m=1 1/2, n=108). Moreover, univariate F-tests for each behavior variable were significant: clarity ($F=9.28$, $MSe=28.89$), expressiveness ($F=39.83$, $MSe=16.72$), interaction ($F=15.13$, $MSe=22.53$), task orientation ($F=7.39$, $MSe=8.79$), organization ($F=23.77$, $MSe=7.87$), for $F(9,223)$ and $p=.00$ for all tests (see Table 8 for means and standard deviations). These results demonstrate that the instructors' teaching behaviors rather than students' generalized

Table 8

IRS Means and Standard Deviations for Each Instructor

	Clarity[a]	Express-iveness[b]	Inter-action[c]	Task–oriented[d]	Organ-zation[e]	Self-efficacy[f]	n
Instructor 1							
M	40.29	39.29	22.93	20.79	10.29	4.00	28
s.d.	5.31	4.51	5.31	2.92	2.62	3.27	
Instructor 2							
M	45.78	45.35	34.39	21.35	11.09	3.65	23
s.d.	4.73	2.72	3.53	3.16	3.29	3.47	
Instructor 3							
M	43.92	38.42	29.08	23.77	15.69	4.08	26
s.d.	5.76	4.75	6.69	2.63	3.15	3.59	
Instructor 4							
M	46.58	46.81	34.04	23.46	17.00	3.50	26
s.d.	5.32	3.15	4.63	2.27	2.06	3.84	
Instructor 5							
M	42.13	39.38	29.21	19.88	9.67	3.79	24
s.d.	5.58	3.94	5.04	2.64	3.27	3.32	
Instructor 6							
M	38.00	45.16	30.26	20.47	14.21	2.95	19
s.d.	4.87	3.32	3.65	3.49	2.10	2.74	

Table 8 (continued)

	Clarity	Express-iveness	Inter-action	Task–oriented	Organ-ization	Self-efficacy	n
Instructor 7							
M	37.77	29.81	24.62	22.54	14.58	2.92	26
s.d.	5.52	5.44	5.63	2.94	2.97	2.91	
Instructor 8							
M	45.22	41.56	31.28	20.39	11.50	3.06	18
s.d.	4.32	3.03	3.43	3.81	3.88	4.76	
Instructor 9							
M	42.79	43.79	30.58	23.25	17.38	2.25	24
s.d.	5.00	3.51	4.25	2.88	1.58	3.23	
Instructor 10							
M	37.35	35.10	30.90	18.95	13.85	2.90	20
s.d.	6.94	6.48	5.90	3.32	3.85	3.36	
Instructors 1-10							
Grand Mean	42.04	40.33	29.51	21.61	13.57	3.35	234
s.d.	6.20	6.48	5.90	3.32	3.85	3.36	

a=clarity of lecture (0-55)

b=expressiveness (0-50)

c=interaction (0-40)

d=task-orientation (0-30)

e=organization (0-20)

f=effort minus ability scores from MMCS (-15 to +15)

efficacy percepts influenced student ratings of effective instruction.

Canonical Correlation Analyses

Three analyses were performed to examine the relation between teaching behaviors and students' coping strategies. The first analysis combined a single self-efficacy score (ability minus effort from the MMCS failure subscale) with five instructor behavior ratings (clarity, expressiveness, interaction, task orientation, organization) in the predictor set of variables of a canonical correlation analysis. The outcome variables were students' coping strategy scores (executive help-seeking, instrumental help-seeking, self-help, persistence without seeking help, and giving-up) which were summed across each item pertaining to a particular strategy. The second set of analyses consisted of two canonical procedures, assessing the relation between teaching behaviors and coping strategies in two levels of self-efficacy groups. The purpose of these two analyses was to determine whether various teaching behaviors were ineffective for low self-efficacy students. Perry and Magnusson have argued that low perceived control students can be characterized by state-associated cognitions which interfere with the beneficial effect of certain teaching behaviors (e.g. Magnusson & Perry, in press; Perry & Magnusson, 1987). Similar to Study 1, students whose effort minus ability failure subscale scores on the MMCS fell below the median (Median=4) were classified as low self-efficacy, while students scoring on or above the median were classified as high self-efficacy. Consistent with the above analysis, a significant canonical relation should be found in the high, but not the low, self-efficacy group. The final analysis canonically related the set of five teaching behavior variables with students' achievement cognitions (most recent test score, ability, effort, test difficulty, luck, expected final grade).

Analysis 1. The first analysis examined the relation between students' coping profile, teaching behavior profile, and student self-efficacy. The predictor set of variables included

ratings of the five teaching behaviors (clarity, expressiveness, interaction, task orientation, organization) and a self-efficacy score computed by subtracting ability ratings from effort ratings using the failure subscale of the MMCS. The outcome variables included the five coping strategies: executive help-seeking, instrumental help-seeking, self-help, persistence, and giving-up. The canonical correlation coefficients (R_i) and characteristic roots (R^2_i) for each of the five variates were as follows: Root 1 (R_1=.30, R^2_1=.09); Root 2 (R_2=.24, R^2_2=.06); Root 3 (R_3=.21, R^2_3=.05); Root 4 (R_4=.09, R^2_4=.01); Root 5 (R_5=.04, R^2_5=.00). The F-test based on Wilks Lambda lead to rejection of the null hypothesis for the omnibus test, $F(30, 894)=1.64$, $p=.02$. Follow-up F-values for Roots 2 to 5 were not significant, all p's > .05.

The correlation coefficients (and z-scores) associated with the first root are provided in Table 9. They suggest that high instructor clarity (.65), interaction (.53), and organization (.51) are associated with instrumental help-seeking (.86) and self-help (.52), but a low degree of persisting without seeking help (-.40). Expressiveness, task orientation, and self-efficacy do not correlate strongly with the canonical variate. These results suggest that some effective teaching behaviors in the present study are associated with effective coping and thus effective use of resources. Of course, teaching behaviors which contribute little to the canonical variate may be less important with respect to students' coping profile only because the present sample of instructors do not exhibit sufficient variation. Alternatively, these lesser weighted teaching behaviors may in fact contribute little to problem definition processes which precede use of various coping strategies.

Table 9

Analysis 1: Coefficients for Significant Roots

Predictor Variables	Root 1 (R_1=.30)
Clarity	.65 (.76)
Expressiveness	-.11 (-.69)
Interaction	.53 (.41)
Task-orientation	.25 (-.13)
Organization	.51 (.33)
Self-efficacy	-.27 (-.30)
Outcome Variables	
Executive help-seeking	-.13 (-.31)
Instrumental help-seeking	.86 (.83)
Self-help	.52 (.09)
Persistence	-.40 (-.24)
Giving-up	.23 (.41)

Analysis 2. The second set of analyses relating teaching behaviors to coping were performed in two parts, one for each level of self-efficacy. Similar to the preceding analysis, the set of teaching behaviors were canonically correlated with students' coping profile, but this analysis was performed separately for low and high self-efficacy groups. For low self-efficacy students, the omnibus test based on Wilks Lambda failed to reject the null hypothesis, approximate $F(25, 443.57)=1.01$, $p=.457$. The canonical correlation coefficients (R_i) and characteristic roots (R^2_i) were: Root 1($R_1=.31$, $R^2_1=.09$); Root 2 ($R_2=.26$, $R^2_2=.07$); Root 3 ($R_3=.18$, $R^2_3=.03$); Root 4 ($R_4=.06$, $R^2_4=.00$); Root 5 ($R_5=.02$, $R^2_5=.00$). For high self-efficacy students, the omnibus test was significant, approximate $F(25, 354.41)=1.83$, $p=.010$. The canonical correlation coefficients (R_i) and characteristics roots (R^2_i) were: Root 1 ($R_1=.45$, $R^2_1=.20$); Root 2 ($R_2=.35$, $R^2_2=.12$); Root 3 ($R_3=.26$, $R^2_3=.07$); Root 4 ($R_4=.14$, $R^2_4=.02$); Root 5 ($R_5=.03$, $R^2_5=.00$). Subsequent F-tests based on Wilks Lambda revealed that only the first root was significant.

The correlation coefficients for the first root, and the standardized coefficients (in parentheses), are presented in Table 10. Examination of the correlation coefficients reveals that all of the teaching behaviors are weighted in a positive direction, with clarity (.89) and interaction (.72) receiving the highest coefficient values, followed by organization (.59), task orientation (.54), and expressiveness (.37). Associated with this teaching profile is a coping profile characterized by endorsement of instrumental help-seeking (.75) and self-help (.69), and unwillingness to persist unaided (-.65). Executive help-seeking is moderately weighted in a negative direction (-.28), while giving-up failed to contribute to the variate (.05). This variate shows that effective teaching behaviors are associated with effective coping in high self-efficacy students. Previous analyses covarying the effect of self-efficacy scores demonstrate that the present effect can not be attributed to high self-efficacy students rating their instructors more positively than.low self-efficacy students.

Table 10

Analysis 2: Coefficients for High Self-Efficacy Group

Predictor Variables	Root 1 (R_1=.45)	
Clarity	.89	(.70)
Expressiveness	.37	(-.25)
Interaction	.72	(.41)
Task-orientation	.54	(.12)
Organization	.59	(.18)
Outcome Variables		
Executive help-seeking	-.28	(-.46)
Instrumental help-seeking	.75	(.63)
Self-help	.69	(.27)
Persistence	-.65	(-.30)
Giving-up	.05	(.32)

Analysis 3. The final canonical correlation analysis clarifies the process by which effective teaching may be related to students' coping. In accordance with Magnusson and Perry (in press), effective teaching should elevate students' performance expectations and lead to perceptions of greater control over their achievement. In the present analysis, students' self-reports of their most recent psychology test, along with their attributions for their test performance (ability, effort, test difficulty, luck) and their expected final grade comprised one set of variables. The other set of variables included the five teaching behavior variables (clarity, expressiveness, interaction, task orientation, organization). The canonical correlation coefficients (R_i) and the characteristic roots (R^2_i) for the five variates were: Root 1 (R_1=.34, R^2_1=.11); Root 2 (R_2=.24, R^2_2=.06); Root 3 (R_3=.18, R^2_3=.03); Root 4 (R_4=.16; R^2_4=.03); Root 5 (R_5=.11, R^2_5=.01). F-tests based on Wilks Lambda revealed that only the first root was significant, $F(30, 822)=1.81$, $p=.01$. The correlation coefficients assessing the strength of association between each variable and the canonical variate, along with the standardized coefficients (in parentheses), are presented in Table 11.

The correlation coefficients for the teaching behaviors are all weighted in a negative direction, with most of the contribution attributed to clarity (-.97) followed by interaction (-.48). Expressiveness (-.29), task orientation (-. 31) and organization (-.28) are all weighted similarly. Clearly, this profile depicts ineffective instruction characterized primarily by low lecture clarity and lack of interact with students, although lack of expressiveness, failure to focus on task, and disorganization also figure moderately. This teaching profile is associated with a low test grade (-.38), deemphasis of internal factors (ability=-.49, effort=-.44), emphasis of external factors (context=.33, luck=.59), and a low expected final grade (-.55). Conversely, one could interpret the variate as effective

Table 11

Analysis 3: Coefficients for Significant Roots

Predictor Variables	Root 1 (R_1=.34)
Clarity	-.97 (-1.13)
Expressiveness	-.29 .30
Interaction	-.48 (-.02)
Task-orientation	-.31 (.07)
Organization	-.28 (-.01)
Outcome Variables	
Most recent test grade	-.38 (.39)
Ability	-.49 (-.42)
Effort	-.44 (-.42)
Test difficulty	.33 (.39)
Luck	.59 (.53)
Expected course grade	-.55 (-.57)

teaching behaviors being associated with emphasis on ability and effort and deemphasis on test difficulty and luck. These results corroborate findings reported by Perry et al. (e.g. Perry & Dickens, 1984) in that teaching behaviors are related to students' achievement attributions, suggesting that effective teaching can increase perceptions of control over academic outcomes.

Discussion

The present study was intended as a preliminary investigation into the possible relation between effective teaching and particular classroom behaviors. Specifically, previous research suggests that by influencing students' achievement attributions, certain teaching behaviors may affect students' coping strategies. Consistent with this hypothesis, IRS scores were significantly related to students' coping profiles. Moreover, IRS ratings were associated with students' achievement cognitions, suggesting that the instruction-coping relation may be mediated by the effect that teaching has on students' problem definition processes. Similar to findings reported by Perry and associates (e.g. Magnusson & Perry, in press), the relation between teaching behaviors and coping was found only in the high self-efficacy group. The implications of each of these findings are discussed in greater detail below.

Teaching Effectiveness and Students' Coping

The results of this study support the prediction that teaching effectiveness is related to students' coping. Teachers who are high in clarity, who interact well with their students, and who are organized, have students who value instrumental help-seeking and self-help. Moreover, these students are not likely to persist unaided when they encounter difficulty, an example of noninstrumental coping (Ames, 1983; Nelson-LeGall et al., 1983). The other predictor variables, namely students' self-efficacy scores, expressiveness, and task-orientation did not contribute to the variate. Although these variables account for only 9%

of the variability in students' coping profile, it provides preliminary evidence that teaching effectiveness is associated with specific classroom behaviors in students. Specifically, by preparing and delivering lectures which are clear and organized, and by interacting with students during and after class, instructors may be promoting effective use of academic resources.

According to the model presented earlier, students adopt effective coping strategies as a result of the influence of effective instruction on achievement cognitions. As students attend to lectures, self-regulation processes cause students to monitor their information processing activities. When teaching is effective, hence optimizing information processing, students are aware of their potential to perform well on tests and assignments based on the lecture content. That is, effective instruction elevates efficacy expectations, and causes students to adopt an attribution profile which emphasizes ability and effort for successful outcomes.

As a result of these achievement cognitions, students should be more likely to cope effectively in the academic environment. First, when they encounter difficulty, they will adopt an instrumental style of help-seeking. That is, they are more likely to ask the instructor for clarification of a point made during a lecture, participate in study groups, use tutoring services, and consult with the teaching assistant. Second, they are more likely to make effective use of self-help resources by looking in the library for supplementary material and using assigned reference material. Finally, when they are experiencing considerable academic difficulty, they are unlikely to persist without seeking help. As discussed previously, this particular strategy is associated with ineffective coping, and thus factors which inhibit its use encourage better achievement.

Consistent with Perry and his associates (e.g. Perry & Magnusson, 1987; Magnusson & Perry, in press), the instruction-coping relation was not found in students who

emphasized ability and deemphasized effort for failure. According to their model, teaching behaviors are effective due to their influence on information processing mechanisms. If these mechanisms are impaired as a result of cognitions associated with low perceptions of control, then the behaviors are no longer effective. Thus, for example, expressiveness does not affect the performance of students who have low control perceptions (Magnusson & Perry, in press). In the present study, effective teaching did not influence the coping strategies of students whose attributions reflected low perceptions of control over academic outcomes.

This finding warrants further research into the cognitive processes involved in the influence that effective teaching has upon students' learning and classroom behavior. From the present data it is impossible to determine if the low self-efficacy group failed to benefit from effective teaching due to attention impairments (Perry & Magnusson, 1987), or if other cognitive deficits were involved. One could hypothesize that their inability to selectively attend to the lecture interfered with the beneficial effects of a variety of teaching behaviors. Alternatively, it may be that low perceived control produced several cognitive impairments, each one interfering with the specific information processing mechanism enacted on by a particular teaching behavior. Disentangling these effects requires systematic investigation into the effects of teaching on information processing.

Instruction-Mediated Cognitions

One of the hypotheses discussed earlier was that effective teaching behaviors influence students' coping due to their effect on achievement cognitions. Consistent with this hypothesis, a canonical analysis showed that the teaching behaviors examined in the present study were associated with students' reported test grade, their achievement attributions, and expected end-of-term grade. Specifically, students who rated their instructors low in lecture clarity, expressiveness, interaction, task orientation and

organization also reported a lower test grade and end-of-term grade. Moreover, their attribution profile was characterized by emphasis of external factors (test difficulty, luck) and deemphasis of internal factors (ability, effort) for performance on their most recent test. Since an earlier analysis demonstrated that students' self-efficacy scores had no influence on instructor ratings, the most probable causal relation is that instruction is fostering these cognitions in students. This assumed relation is further supported by experimental evidence in which students' attributions were systematically influenced by manipulating the frequency of expressiveness-related teaching behaviors (e.g. Perry & Magnusson, 1987).

If, in fact, teaching behaviors are causing these cognitions in students, then this relation could account for the association found between instruction and coping. That is, by increasing behaviors related to lecture clarity, organization, and interaction, for example, teachers may enhance information processing in students. Due to their elevated ability to process lecture material, students may then develop higher expectations of their peformance capabilities. As a result, they are more likely to attribute academic outcomes to factors which reflect their increased performance capacity, and thereby influence their coping strategies. When academic difficulty is anticipated, such students are more likely to focus on skill development, and access resources characterized by instrumental aid.

In summary, the present study provides preliminary evidence that the influence of teaching effectiveness extends to students' classroom behaviors. In particular, by acting on problem definition processes, effective teaching may be affecting how students cope with academic difficulties. According to the present findings, high ratings on specific teaching behaviors are related to students' use of instrumental and self-help resources. Students who rated their instructors high on these behaviors were more likely to use these resources compared to students who provided low ratings. However, this relation appears to be absent in students whose stable attributions for failure reflect low efficacy beliefs. Further

research of an experimental nature is required in order to determine the causal direction of this effect.

Study 3

The final study focuses on an important help-seeking variable which teachers can influence through various classroom organization and evaluation procedures (Ames, 1983). This variable concerns the degree to which students are task-involved versus ego-involved. Task-involved students process performance-relevant information, and are concerned with improving their past performances. Ego-involved students process social comparison information, and are concerned with how well they perform in relation to others. Ames (1983) has suggested that task-involvement produces attributions which are relevant to help-seeking and ego-involvement produces attributions that inhibit help-seeking. He further argued that the effects of ego-involvement depend on students' perceptions of their abilities. Specifically, ego-involvement should inhibit help-seeking in students who lack confidence in their academic ability but not in students who are confident of their academic ability. The present study extends Ames' argument by differentiating between styles of help-seeking. Thus, the effects of task- versus ego-involvement on frequency of help-seeking is expected to differ depending on whether the help-source is associated with instrumental or executive aid.

The distinction between task- and ego-involvement was made by Nicholls (1979). He argued that some achievement situations motivate students to demonstrate high ability, and other situations motivate students to avoid failure. Each of these motivational sets is associated with a different conception of ability. In the conception associated with demonstrating talent, ability is assessed in terms of improvements and skill development. In the other conception, ability is assessed in terms of how well one performs compared to others. According to Nicholls (1979), students' achievement behavior differs depending on which conception of ability is encouraged in a particular achievement setting. Settings which invoke the former conception of ability produce task-involved behaviors,

characterized by a focus on skill enhancement. The latter conception of ability produces ego-involved behaviors, characterized by self-focus and ego enhancement.

Nicholls (1979) points out that ego-involvement is prevalent in classrooms which use a competitive reward structure and in which evaluations are primarily norm referenced. Researchers have found that these conditions cause students to focus on ability as a causal factor, with success attributed to high ability and failure attributed to low ability (Ames, Ames, & Felker, 1977). On the other hand, task-involvement is more prevalent in noncompetitive situations in which social comparison of performance is limited (Nicholls, 1979). Research has shown that these conditions cause students to view effort, rather than ability, as a salient causal factor (Ames, 1978; 1981; Ames & Ames, 1978; Ames, Ames, & Felker, 1977). Thus, under noncompetitive conditions poor performance is more likely to be attributed to lack of effort.

Nicholls (1979) further theorizes that a student's reaction to ego-involvement depends on his or her level of perceived ability. Students with high perceived ability expect to be evaluated favorably relative to others, and therefore are not threatened by social comparison. However, ego-involved students with low perceived ability expect to be evaluated unfavorably. They are therefore more likely to make lack of ability attributions under ego-involved conditions than students with high perceived ability. Individual differences between these groups of students are not expected under task-involved conditions, which cause students to analyze their performance in terms of effort rather than ability (Ames, 1983).

The Effect of Task- versus Ego-Involvement on Help-Seeking

Due to their influence on achievement attributions, task-involved versus ego-involved motivational sets should affect students' instrumental and executive help-seeking. According to the help-seeking model presented earlier, academic difficulties which are

attributed to internal, unstable controllable factors such as lack of effort should lead to instrumental help-seeking, and attributions to internal, stable, uncontrollable factors such as lack of ability should lead to executive help-seeking (see Table 1). As discussed above, task-involvement seems to cause students to focus on skill development, and analyze their performance in terms of effort. That is, failure is more likely to be attributed to lack of effort rather than lack of ability. Hence, task-involvement should increase use of an instrumental help-source, thereby facilitating skill enhancement in students. However, ego-involvement causes students to analyze their performance in terms of ability. Ego-involvement should therefore have little adverse effect on students who are confident of their ability, but will adversely affect students who lack confidence in their ability (Ames, 1983; Nicholls, 1979). Low perceived ability students who are ego-involved are therefore expected to request executive aid more than high perceived ability students.

These hypotheses were tested by having students solve a series of analytical reasoning problems under task- or ego-involved classroom conditions. Students' level of perceived ability was inferred using the procedure described in Studies 1 and 2. That is, low self-efficacy students, who lack confidence in their ability, were those who emphasized ability for failure; high self-efficacy students, who are confident of their ability, were those who emphasized lack of effort for failure. Students were then provided with either instrumental or executive aid and their frequency of help-seeking was assessed. The design was therefore a self-efficacy (low, high) x motivational set (task- vs. ego-involved) x help-source (instrumental, executive) factorial design. The dependent variables were help-seeking, task performance, and performance attributions.

Method

Subjects

Subjects were 226 male and female students from the University of Manitoba subject pool. The subject pool is comprised of students enrolled in Introductory Psychology who wish to earn credits through research participation. Subjects volunteered by entering their names in a sign-up booklet, thereby assigning themselves to a particular experimental session. Experimental conditions were then randomly assigned to each session.

Materials

Analytical Reasoning Task (ART). The experimental task consisted of five sets of problems, with five multiple-choice questions in each set. The 25 questions were of the type found in the Graduate Record Examination, and were adapted from a sample test found in a preparation manual (Crocetti, 1985). This particular task was chosen based on two criteria. First, it was thought that most students would not have encountered this type of problem before, and therefore would be susceptable to the task- vs. ego-involved manipulation. Second, the task was expected to be at least moderately difficult so that students who used the help sources would not all achieve 100%. It is noted that the purpose of the task was not to assess analytical reasoning skills in students, but rather to provide an opportunity to examine help-seeking. Each item was followed by five response alternatives lettered A,B,C,D, and E. Students chose the response alternative they believed was correct and entered their choice in the appropriate area on a machine-scored IBM response-sheet. The ART was presented in three sections, each with a time limit for completing the questions. Section 1 consisted of five questions, for which ten minutes were allowed. Sections 2 and 3 each had ten questions and students were allowed 20 minutes to complete a section. The entire task therefore took 50 minutes to complete. (Refer to Appendix E for a copy of the Analytical Reasoning Task.)

Help source. The type of help available was manipulated using two versions of a "Helpful Hints" sheet. One sheet contained only instrumental help by providing students with specific strategies that lead to greater accuracy and speed in solving the problems. The strategies, typed onto sheets of paper using invisible ink, were presented as four separate "hints". Students could reveal one or more of the hints by stroking over the designated areas using a special marking pen. Students were advised to mark over the hints in the order in which they were presented (see Appendix F).

The other version of the "Helpful Hints" sheets contained only executive help. These hints revealed portions of answers, without providing students with strategies useful for solving future problems. There were four hints typed in invisible ink for each multiple-choice question. Each hint was of the form "NOT (X)", where "X" was replaced with one of four of the five following letters: A, B, C, D, and E. By stroking over a hint with the special marker, students could reveal information that allowed them to concentrate on choosing among the remaining alternatives. For example, if a student revealed a hint that read "NOT A", he or she could focus his/her attention on the four remaining alternatives (B, C, D, E). If the next hint read "NOT D", then he/she improved the chances of selecting from the remaining alternatives (B, C, E). Thus, each hint provided a partial disclosure of the answer, and successively improved the chances of selecting the correct alternative as the number of revealed hints increased. Of course, if students revealed all four hints for a given item, then the correct response alternative was completely disclosed. Students were informed that the four hints for each question were entered randomly.

Students were allowed to use the "Helpful Hints" sheets for ten questions (i.e., Questions 6 through 15, inclusive). Questions 1 through 5 were completed unaided in order to determine a priori differences among low and high self-efficacy students. Thus, performance on the first five questions could be used to determine whether high self-

efficacy students have more ability for this task than low self-efficacy students. For the next ten questions (Question 6 through Question 15) , students were instructed to use the sheets as often as they wished. Finally, for the last ten questions (Question 16 to Question 25), students were instructed to turn their "Helpful Hints" sheets over. Any differences in the performance of instrumental and executive students after help had been removed could thus be detected (refer to Appendix F for a copy of the Helpful Hints sheets).

(MMCS). The MMCS and the procedure used for assessing self-efficacy beliefs were described in Study 1 (see also Perry & Penner, in press).

Motivational set instructions. Task- and ego-involvement were manipulated using two sets of instructions which were delivered before students wrote the ART. The following instructions for task-involvement attempted to focus students' attention on the intrinsically interesting features of the ART problems, as well as on their ability to improve their problem-solving skills with each successive problem:

> Most of you will not have encountered these types of problems before, but I think you will find these puzzles interesting and fun to work at. As you tackle each problem, try to understand it a little better than the one you attempted previously. Eventually, you may find yourself becoming more skillful in solving these types of problems. Do not worry about how others are performing. Just concentrate on your own performance and have fun trying to do better at each problem as you go along.

On the other hand, the ego-involved instructions focused students' attention on how well they performed in comparison with other students':

> We are interested in finding out how each individual student performs in comparison with other students. That is, we will mark all of your papers to determine a distribution of marks. Then we will examine each individual score to

find out how it compares with other scores. So that you can have immediate feedback about how well you performed, I will quickly make a frequency distribution of this group's scores when you have all finished, and post the distribution. You can check this distribution as you are leaving the room, thereby determining for your own interest whether you scored below, above, or near average.

Dependent Measures

Help-seeking. Degree of help-seeking was measured by counting the number of hints revealed on students' help sheets (refer to Appendix F). In the executive conditions, hints were provided for questions in Section 2 (Question 6 to Question 15) of the ART. Questions in Sections 1 and 3 were completed without any assistance and served as an assessment of how students performed before and after helping, respectively. Since there were four hints per question, the total number of executive hints that students could have used ranged from 0 to 40. In the instrumental helping conditions, students were also allowed to use their helping sheets for Section 2 only. Since four hints were provided on the instrumental helping sheets, students' help-seeking scores ranged from 0 to 4. Thus, the scales measuring use of each type of help-source were different.

Performance. Students' performance on the ART was assessed in three sections. Section 1 consisted of Question 1 to Question 5, and was presented with no opportunity for help-seeking. Students' scores for this section were used to determine whether low and high self-efficacy groups differed in their ability to solve these types of problems. Sections 2 and 3 each consisted of two problem sets (10 questions). As students worked through Section 2 (Question 6 to Question 15), the instrumental or executive help sheets were available. For Section 3 (Question 16 to Question 25) help was unavailable. Students' scores for Section 2 were used to measure their performance with help available, while

scores for Section 3 measured performance after helping was removed.

Attributions. Students' causal attributions for their performance on the ART were assessed in accordance with Weiner's attribution model (Weiner, 1979; 1986). Students' were asked to indicate on a ten-point scale the extent to which ability, effort, task difficulty, or luck determined their performance on the ART (0=not at all determined, 9=competely determined). They were also asked to indicate on a ten-point scale, how much ability they have for the task, how hard they tried, how difficult they found the task, and how lucky they were on the task (0=not at all, 9=completely). While the first set of attribution questions determined the extent to which students' felt that these factors are causes, the second set of questions determined the extent to which they felt that these causes were available to them (refer to Appendix G).

On this questionnaire, a manipulation check item for motivational set was included. The purpose of this item was to determine whether students assessed their ability to perform on the task in terms of improvements (task-involved) or comparison with others (ego-involved). Students were asked to indicate on a 10-point scale the extent to which their assessment of their ability was based on how much they improved with each problem (0=improvement with each problem) versus how well they performed compared with others (9=comparison with others).

Procedure

Students participated in groups of approximately 30. After being seated in a classroom, students were informed of their right to leave during any portion of the experiment without jeopardizing their participation credit. They were also reminded of their responsibility to respond as honestly as possible for the duration of the experiment. The experimenter then handed each student a booklet containing the MMCS, an IBM response sheet, the ART, a Helpful Hints sheet, and the Attribution Questionnaire. Students completed the MMCS after receiving instructions related to the questionnaire and the use of the IBM response

sheet. After all students had completed the MMCS, they received a set of instructions pertaining to (1) the ART, (2) the Helpful Hints sheets, (3) the motivational set manipulation, (4) time limits for completing the three sections of the ART.

Students were given 10 minutes to complete Section 1, after which they were instructed that they could use their "Helpful Hints" sheets. For the next 20 minutes students worked on Section 2, after which they were told to turn their helping sheets over. They were then allowed 20 minutes to work on Section 3. When this time had elapsed, students were asked to retrieve the Attribution Questionnaire from their booklets and were instructed on how to respond to the items. After all students had completed the questionnaire, the full purpose of the experiment was explained to them and their questions were answered.

Results

Self-Efficacy

As in Study 1, students' ratings of the contribution of their ability compared to their effort for academic failure outcomes were used as an indication of their academic efficacy beliefs. Thus, students were classified as low or high self-efficacy by subtracting their total ability attribution ratings from their total effort attribution ratings using the failure subscale from the MMCS. Using this procedure, the possible range of scores was from -15 to +15, and the median score was +4. Students who scored +3 or less were classified as low self-efficacy, and students who scored +4 or more were classified as high self-efficacy. This split resulted in 110 subjects classified as low self-efficacy and 116 subjects classified as high self-efficacy.

Analytical Reasoning Task (ART)

Students' performance on the ART was analyzed using Analyses of Variance (ANOVA) for each of the three sections. For Section One, consisting of five questions, a one-way ANOVA was performed to examine the effect of students' self-efficacy cognitions

on ability to achieve on the task. This procedure determined whether a priori differences existed in low and high self-efficacy students' ability to perform on the ART. If differences existed, then detection of later performance differences would be difficult to interpret since they could be due to the superior ability of one group or more frequent help-seeking of one group. The ANOVA revealed no effect of self-efficacy (low, high) for this section, $F(1,224)=1.42$, $MSe=1.54$, $p= .24$. The mean for low self-efficacy was $M=2.04$, $s.d.=1.24$, and the mean for high self-efficacy was $M=2.23$, $s.d.=1.24$. This finding suggests that no a priori differences existed between self-efficacy groups in their ability to perform on this task.

Performance in Section Two (ten questions) was analyzed by means of a help-source (executive, instrumental) by motivational set (task, ego) by self-efficacy (low, high) 2x2x2 ANOVA (see Table 12 for means and standard deviations). Results revealed main effects for help source, $F(1,218)=26.89$, $MSe=4.77$, $p= .00$, and motivational set, $F(1,218)=3.88$, $p=.05$, but no effect for self-efficacy, $F(1,218)=0.07$, $p=.80$. The collapsed means for the help-source main effect showed that students in the executive aid condition ($M=5.19$) outperformed students in the instrumental aid condition ($M=3.67$). Also, the collapsed means for the motivational set main effect showed that ego-involved students ($M=4.72$) outperformed task-involved students ($M=4.14$).

The self-efficacy main effect was qualified by a help source by self-efficacy interaction, $F(1, 218)=5.30$, $p= .02$. The interaction was probed by examining the means for low and high self-efficacy students across help-source conditions. Using the Bonferroni procedure for nonorthogonal contrasts, the critical value was found to be t(critical)$=2.26$, $p\leq .05$ (one-tailed), for four comparisons (corresponding to four simple main effects). The critical

Table 12

Performance and Help-Seeking Means and Standard Deviations

	Instrumental Help			
	Task-involved		Ego-involved	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Section 2				
M	2.86	3.71	3.73	4.38
s.d.	2.22	2.23	2.27	2.31
Section 3				
M	4.46	4.64	4.92	5.41
s.d.	2.52	2.33	1.57	1.90
Help-seeking				
M	2.86	2.36	2.31	1.78
s.d.	1.38	1.66	1.57	1.52
n	28	28	26	32

Table 12 (continued)

	Executive Help			
	Task-involved		Ego-involved	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Section 2				
M	5.12	4.88	5.86	4.91
s.d.	1.74	2.44	2.51	1.87
Section 3				
M	4.38	4.88	4.23	5.06
s.d.	2.09	1.78	2.27	2.40
Help-seeking				
M	8.91	10.04	16.36	10.09
s.d.	9.04	10.50	10.26	8.26
n	34	24	22	32

value was computed using Kirk's (1982) approximation based on the standard normal distribution. Low self-efficacy students were found to perform significantly more poorly under instrumental helping conditions (M=3.31) than under executive helping conditions (M=5.49), t(218)=5.23. However, the performance of high self-efficacy students did not differ for instrumental (M=4.05) compared to executive (M=4.90) help-source conditions, t(218)=2.09. When the interaction was further probed by comparing low and high self-efficacy students' performance under instrumental and executive help-source conditions, no significant differences were found, t(218)=1.81 and t(218)=1.43, respectively. Thus, the interaction appears to result from low self-efficacy students taking advantage of the partial disclosure of answers available from the executive help-source in order to improve their performance.

Finally, a help-source by motivational set by self-efficacy ANOVA performed on students' scores in Section Three (ten questions) revealed no main effects or interactions (see Table 12 for means and standard deviations). Differences in scores between self-efficacy groups approached, but did not reach, significance, F(1,218)=3.01, MSe=4.56, p= .08.

Help-Seeking

Because help-seeking scores for instrumental and executive help-source conditions reflect different scales, these conditions were considered separately. That is, the instrumental help-seeking scores could range from 0 to 4, whereas the executive help-seeking scores had a possible range of 0 to 40. For each help-source condition, a self-efficacy (low, high) by motivational set (task, ego) 2x2 ANOVA was performed. For instrumental help-seeking, the ANOVA revealed a main effect for motivational set only, F(1,110)=3.83, MSe=2.35, p= .05 (see Table 12 for means and standard deviations). Examination of the means shows that task-involved students, M=2.61, engaged in more

help-seeking than ego-involved students, M=2.04 (see Figure 5). For executive help-seeking, a main effect for motivational set was revealed, F(1,108)=4.31, MSe=88.48, p=.04 (see Table 12 for means and standard deviations). The marginal means show that ego-involvement produced more help-seeking, M=13.23, than task-involvement, M=9.48.

This effect is qualified by a self-efficacy by motivational set interaction effect, F(1,108)=4.19, p=.04 (see Figure 6). The interaction was probed using the Bonferroni procedure described earlier which controlled the family-wise error rate at $p \leq .05$. Four nonorthogonal contrasts corresponding to tests of four simple main effects were performed in order to determine whether low and high self-efficacy students differed in help-seeking across ego versus task conditions. The critical value for four one-tailed pairwise comparisons was t(critical)=2.27. For low self-efficacy students, a significant difference between task (M=8.91) and ego (M=16.36) conditions was found, t(108)=2.89. However, no effect was found between high self-efficacy task (M=10.04) and ego (M=10.09) students, t(108)=.02. The interaction was further probed by comparing low versus high self-efficacy students for each motivational set condition. Under task-involved conditions, no difference was found between self-efficacy groups, t(108)=.45. However, the difference between low and high self-efficacy groups reached significance in the ego-involved condition, t(108)=2.41.

Thus, one interpretation of the interaction effect appears to be that low self-efficacy students used more executive help in ego- compared to task-involved conditions, whereas high self-efficacy students were unaffected by motivational set instructions. Alternatively, one could say that under task-involved conditions, low self-efficacy students used the executive help-source the same amount as high self-efficacy students. However, under

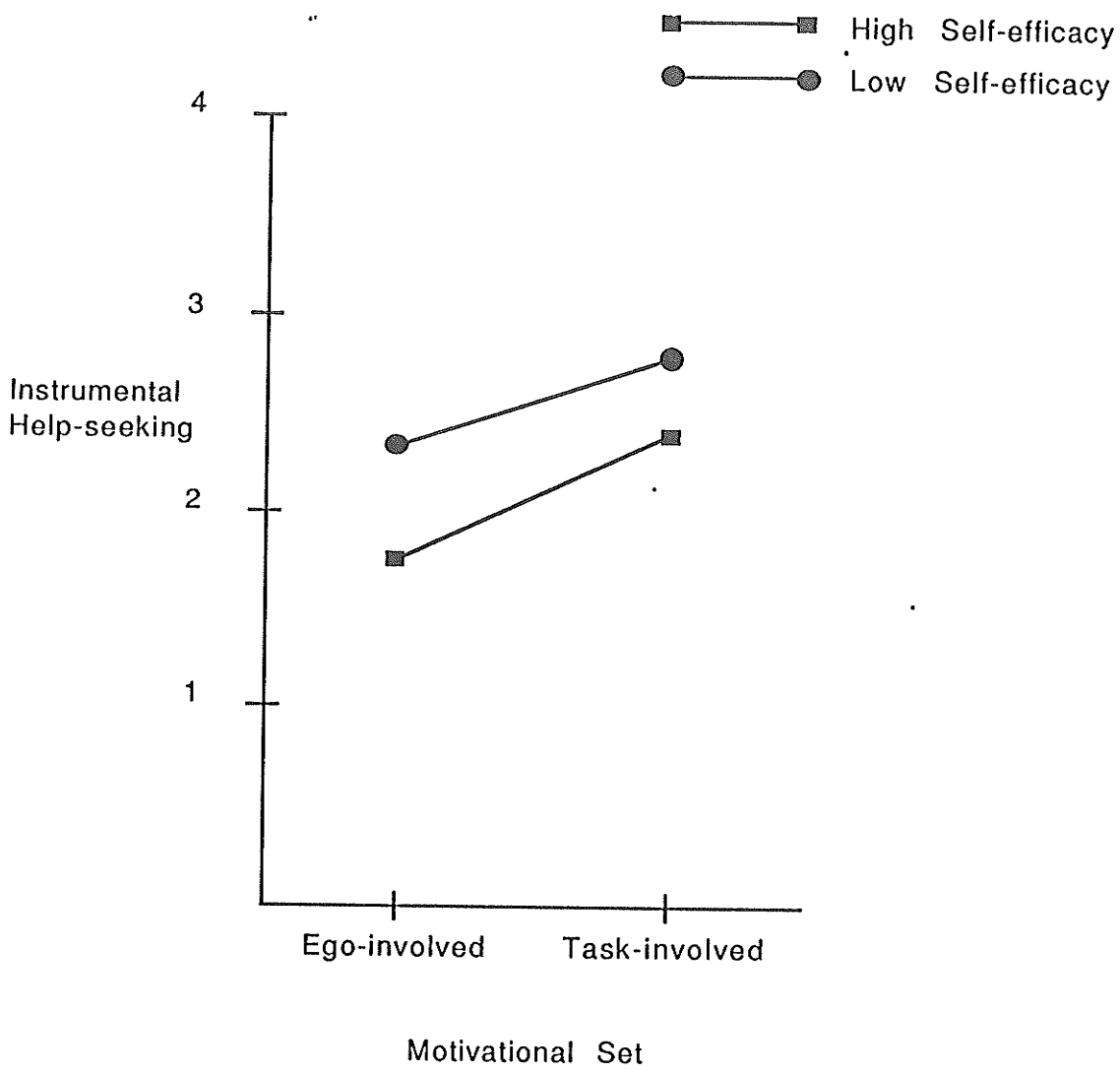

Figure 5: The effect of motivational set on low and high self-efficacy students' instrumental help-seeking is depicted. Task-involvement produces more instrumental help-seeking than ego-involvement, and this effect is the same for low and high self-efficacy students.

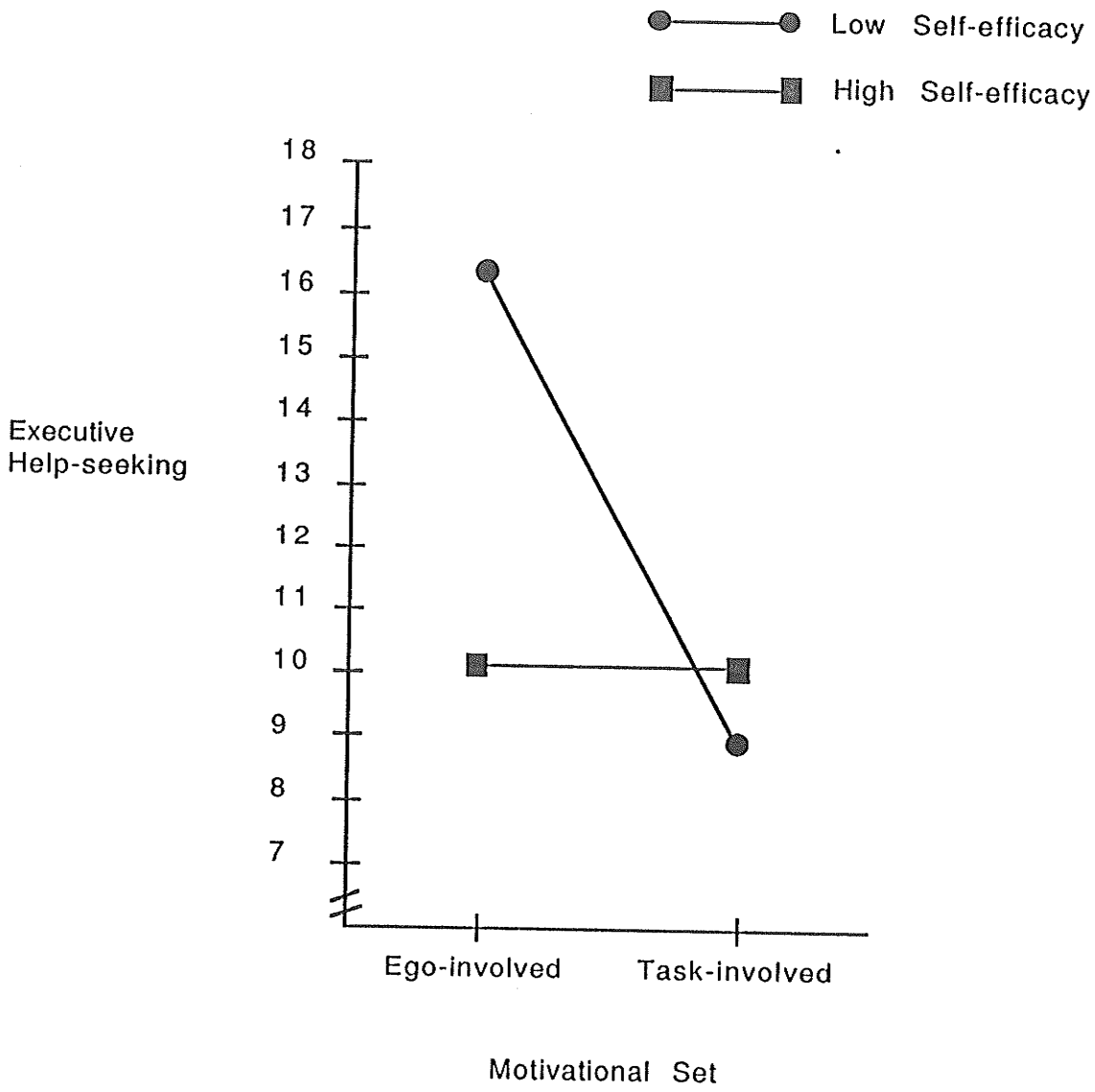

Figure 6: The effects of motivational set on executive help-seeking are depicted above. Ego-involved/low self-efficacy students used the executive help-source more than task-involved/low self-efficacy students. The executive help-seeking of high self-efficacy students was unaffected by motivational set.

ego-involved conditions, low self-efficacy students engaged in more executive help-seeking than high self-efficacy students.

Performance Attributions

Students' achievement attributions were analyzed using univariate and multivariate analyses of variance, combining help-source (executive, instrumental), motivational set (task, ego), and self-efficacy (low, high) into a 2x2x2 factorial design. A multivariate procedure was chosen for some items because they formed a conceptual unit. Where items did not form a conceptual unit, they were analyzed using univariate procedures. Results of ANOVA's performed on the following items revealed no main effects or interactions: (1) How much ability do you have for this task; (2) the manipulation check item (task-involved vs. ego-involved assessment of ability); (3) How hard did you try; (4) How difficult was the test; (5) How successful do you feel. Moreover, a 2x2x2 MANOVA performed on the ability, effort, task difficulty, and luck items (How much did _____ determine your performance on the test?) revealed no main effects or interactions. A multivariate procedure was used on these latter items in order to determine differences in a single composite attribution profile across the various groups. Table 13 reports the means and standard deviations for all attributions items.

Supplementary Analyses

Additional analyses were carried out to determine whether students' attribution ratings were related to their instrumental and executive help-seeking. Median splits were used to classify students as low or high on the ability items on the questionnaire. One item assessed how much ability students believed they had for the task (ability have) and the other item assessed how much students believed ability contributed to their performance on the task (ability contribute). After dichotomizing the variables, "ability have" (low, high) and "ability contribute" (low, high) were combined in a factorial design. Separate 2x2

Table 13

Means and Standard Deviations for Attribution Items

	Instrumental Help			
	Task-involved		Ego-involved	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Ability have?				
M	5.46	6.00	6.15	6.38
s.d.	2.40	2.24	2.20	1.76
Manipulation check				
M	4.54	4.79	5.27	4.78
s.d.	2.38	1.97	2.59	2.43
How hard try?				
M	7.61	7.61	7.19	7.38
s.d.	1.75	1.79	1.92	1.74
How difficult?				
M	7.21	6.82	6.85	6.66
s.d.	1.48	1.74	1.71	1.93
How successful?				
M	5.29	5.26	5.08	5.97
s.d.	2.62	2.57	2.31	2.22

Table 13 (continued)

	Instrumental Help			
	Task-involved		Ego-involved	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Ability				
M	6.23	6.48	6.09	6.59
s.d.	2.08	2.06	2.29	2.11
Effort				
M	6.85	7.08	6.59	7.31
s.d.	2.24	2.02	2.36	2.01
Task difficulty				
M	7.58	6.32	6.41	6.13
s.d.	1.27	2.16	2.15	2.28
Luck				
M	3.50	4.24	3.14	2.91
s.d.	2.49	2.68	1.94	1.91
n	26	25	22	32

Table 13 (continued)

	Executive Help			
	Task-involved		Ego-involved	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Ability you have?				
M	5.53	5.79	5.57	6.00
s.d.	2.43	2.02	1.86	2.34
Manipulation check				
M	5.06	4.83	4.76	4.41
s.d.	2.16	1.76	1.73	2.21
How hard try?				
M	7.50	7.29	7.10	7.59
s.d.	1.66	1.38	1.61	1.39
How difficult?				
M	6.94	6.58	7.29	6.59
s.d.	1.41	1.67	1.10	1.90
How successful?				
M	5.21	5.18	4.52	5.38
s.d.	2.43	2.46	2.50	2.09

Table 13 (continued)

	Executive Help			
	Task-involved		Ego-involved	
	Low Efficacy	High Efficacy	Low Efficacy	High Efficacy
Ability				
M	6.07	5.77	5.85	5.84
s.d.	2.14	2.45	2.03	2.38
Effort				
M	6.45	6.73	6.00	6.36
s.d.	1.93	1.75	2.08	2.06
Task difficulty				
M	6.97	6.41	6.70	6.45
s.d.	1.87	1.84	1.38	2.01
Luck				
M	3.55	4.05	4.30	3.81
s.d.	2.53	2.55	2.47	2.39
n	31	22	20	31

ANOVAs were then performed with instrumental and executive help-seeking as dependent variables.

For instrumental help-seeking, a main effect was found for "ability have", $F(1, 110)=8.47$, $MSe=2.26$, $p=.004$. The "ability contribute" main effect, $F(1,110) = 0.53$, $p =.47$, and the interaction effect, $F(1,110) = 0.16$, $p = .69$, were not significant. The marginal means for the significant main effect show that low "ability have" students used the instrumental help-source more, $M=3.03$, than the high "ability have" students, $M=2.03$. Thus, students who believed they lacked ability for the task were more likely to engage in instrumental help-seeking than students who believed they had ability. Although this finding does not support the model presented earlier, it is consistent with the finding that low self-efficacy students increased their instrumental help-seeking from task-involved to ego-involved conditions. Hence, contrary to the model, instrumental help-seeking may occur in students who lack confidence in their academic ability (see Table 14 for means and standard deviations).

When a 2x2 ANOVA was performed on executive help-seeking, only the interaction effect was found to be significant, $F(1, 107)=5.29$, $MSe=89.67$, $p=.02$. Four one-tailed pairwise comparisons, corresponding to tests of the simple main effects, were performed to probe the interaction. The Bonferroni procedure was used to control the family-wise error rate at $p \leq .05$ (critical $t = 2.27$). Using this procedure, only the difference between low and high "ability contribute" students within the high "ability have" group was found to be significant, $t(107)=2.31$, $p < .05$. An examination of the means (in Table 14) show that among students who rated themselves high on the "ability have" item, those who felt that their ability was an important factor contributing to their performance used the instrumental help-source less, $M=8.60$, than students who felt that their ability was not an important factor contributing to their performance, $M=14.81$. These results indicate that students

Table 14

Help-seeking Means and Standard Deviations for Ability Attribution Groups

	Low Ability Have		High Ability Have	
Help-seeking	Low Contribute	High Contribute	Low Contribute	High Contribute
Instrumental				
M	3.22	2.83	2.08	1.97
s.d.	1.00	1.54	1.17	1.65
n	18	18	12	66
Executive				
M	11.00	14.05	14.81	8.60
s.d.	8.71	8.97	13.29	8.58
n	21	19	16	55

who are confident of their ability to perform well will in fact engage in executive help-seeking if they feel that ability is not an important factor contributing to their performance.

Discussion

The purpose of the study was to explore one method by which teachers can influence students' help-seeking. By creating classroom conditions which favour a particular motivational set, teachers should be able to regulate students' use of instrumental and executive help-sources. Specifically, ego-involvement was expected to increase executive help-seeking in low but not high self-efficacy students. Moreover, task-involvement was expected to eliminate individual differences due to self-efficacy beliefs. Although many of the results support these predictions, some inconsistent findings emerged, as explained below.

Executive Help-Seeking

Students' pattern of help-seeking in the executive help source condition was as predicted. Ego-involvement increased the executive help-seeking of low, but not high, self-efficacy students. These findings are consistent with the argument that one's reaction to ego-involvement depends on one's perceived level of ability (Ames, 1983). Ego-involvement causes students to assess their ability in terms of others' performance. However, because of their respective ability beliefs, high self-efficacy students arrive at a more favorable assessment than low self-efficacy students. Hence, under ego-involved conditions, low self-efficacy students make more low ability attributions and therefore engage in more executive help-seeking.

As expected, task-involvement removed differences in executive help-seeking which were due to self-efficacy beliefs. Task-involvement causes one to analyze one's performance in terms of effort, rather than ability (Ames, 1983). Thus, both low and high self-efficacy students are expected to attribute failure to lack of effort. Accordingly, low

self-efficacy/task-involved students engaged in the same amount of executive help-seeking as high self-efficacy/task-involved students. Moreover this amount was significantly less than that of low self-efficacy/ego-involved students. This pattern of help-seeking nicely demonstrates Ames' (1983) prediction that individual differences apparent under ego-involved conditions disappear under task-involved conditions.

Instrumental Help-Seeking

The pattern of instrumental help-seeking is not entirely consistent with the explanation provided in the previous section. If, as Ames (1983) argued, ego-involvement causes individual differences to emerge, the level of instrumental help-seeking should be different for low compared to high self-efficacy students. That is, ego-involvement was expected to produce less instrumental help-seeking in low, but not high, self-efficacy students. However, the results showed no differences between these two groups of students. In fact, both groups decreased their use of the instrumental help-source to the same extent in task-involved compared ego-involved conditions.

In order to account for these findings, one must consider how task- vs. ego-involved students structure their behavior differently in accordance with different goals. Task-involvement seems to cause students to focus on skill development. When they require aid, they seek a help-source consistent with their goal of developing skills. Because instrumental help-seeking is consistent with this goal, its frequency increases under these conditions. However, ego-involvement shifts students' focus from skill development to social comparison. Their goal is thus related to ego enhancement rather than skill enhancement, and their focus is on the outcome rather than the process of task performance. Unlike executive aid, instrumental aid does not simply supply the recipient with the appropriate outcome and therefore does not provide instant ego enhancement. Hence, instrumental help-seeking is inconsistent with this goal, and is therefore expected to

decrease under ego-involved conditions.

According to Ames (1983), high self-efficacy students should engage in instrumental help-seeking to the same extent across task- and ego-involved conditions. That is, these students should maintain effort attributions in both conditions and should therefore seek appropriate assistance when they encounter difficulty. The decrease in instrumental help-seeking in these students indicates that one must consider how motivational set influences the goals of students, in addition to attributions. As described above, instrumental help-seeking may fail to occur in the presence of appropriate attributions if the goal of the help-seeker (i.e. ego enhancement) is inconsistent with the type of help available (i.e. skill enhancing). This explanation accounts for the finding that high self-efficacy/ego-involved students engaged in less instrumental help-seeking than high self-efficacy/task involved students.

Student Performance and Attributions

Analyses on Section 1 ART scores (Questions 1 to 5) showed that low and high self-efficacy students initially scored the same. Therefore, differences in students' ART scores and help-seeking in later sections can not be attributed to the different performance capacity of each self-efficacy group. In Section 2 (Questions 6 to 15), at least some of the performance variance was accounted for by a help-source by self-efficacy interaction: low self-efficacy/instrumental students had lower scores than low self-efficacy/executive students. This finding partially reflects the more frequent use of executive aid by low self-efficacy students. It is noted, however, that the three-way interaction was not significant. Thus, the performance results do not reflect the more frequent use of executive aid by ego-involved/low self-efficacy students compared to task-involved/low self-efficacy students. An examination of the means for low self-efficacy students in the executive condition shows a small difference in the predicted direction, with ego-involved/low self-efficacy

students scoring slightly more than task-involved/low self-efficacy students. However, since this difference did not produce a significant three-way interaction, it must be interpreted with caution.

Finally, students' achievement in Section 3 did not reveal any effects of the independent variables. One explanation of this finding is that the task was sufficiently demanding and long that students' began to fatigue as they progressed. Thus, differences between groups may have failed to emerge as a result of a fatigue factor. In addition to fatigue, the difficulty of the task, combined with the time limits imposed on students, may have limited the extent to which instrumental aid was incorporated into students' problem-solving strategies. Thus, while instrumental aid was expected to maintain improved performance after helping was removed, the nature of the task may have inhibited the incorporation of the strategies.

Students' achievement attributions likewise showed no effects due to the independent variables. Once again, the most likely explanation is that students' attributions, along with the manipulation check, were assessed after the task when students were fatigued. If this explanation is correct, then changing the experimental procedures by using a less demanding task, and allowing time for incorporation of instrumental strategies may result in attribution effects. One would expect, for instance, that students who successfully incorporate the strategies suggested by the instrumental help-source will report greater perceptions of control over their achievement, compared to students who use executive aid.

Implications for the University Classroom

Instrumental and executive help-seeking have different academic consequences. Although instrumental aid fosters skill development and promotes independence of the help-source, executive aid retards skill development and encourages dependence on the help-source. Thus, while making extensive use of an executive help-source will

temporarily elevate performance, its long term effects could be damaging. These deleterious effects may be compounded if students also fail to make effective use of an instrumental help-source. The present study showed that both individual differences and situational factors contribute toward this pattern of ineffective help-seeking in some students.

Students who are most at risk appear to be those with low self-efficacy beliefs. When they are exposed to ego-involved classroom conditions, they (1) fail to use an instrumental help-source as frequently as when task-involved, and (2) use an executive help-source more frequently than when task-involved. This help-seeking pattern is particularly damaging in the university classroom setting where executive aid may be readily available during the semester, but frustratingly absent during exam period. One would therefore expect that the longterm consequences of this help-seeking pattern include more frequent failure compared to students who use help effectively.

One could further argue that the most typical university classroom conditions are those which promote ego-involvement. For instance, posting a frequency distribution of exam results is a common practise among university instructors. Other common practises which could engage social comparision processes include: posting exam results with corresponding student numbers; marking students "on a curve"; limiting enrollments for more advanced programs. Given that these conditions are ubiquitous throughout university, low self-efficacy students may be consistently adopting a help-seeking style which can have serious consequences.

While task-involvement appears to lead to the most effective use of resources for both low and high self-efficacy students, one should be careful not to place a value judgement on practises associated with ego-involvement. First, they are not easily disposed of in the university setting. For example, while limiting enrollments for medical school encourages competition and social comparison among students, it is most likely impractical, if not

impossible, to adopt a system which does not promote competition. Second, the present study extracted certain features of the classroom for study in a laboratory setting. If one argues that the classroom represents a social system, then the influence of ego- or task-involvement on the entire system may present a different picture than when these effects are taken out of context. Most likely, any given motivational set has both its advantages and disadvantages depending on which features of the classroom are isolated for study.

In summary, the present study contributed two important findings. First, it suggested that under typical university classroom conditions, low self-efficacy students adopt an executive help-seeking style. Second, it suggested that a relatively simple procedure can be used by teachers to promote more effective help-seeking in these students. That is, by creating conditions favorable to task-involvement, teachers can promote instrumental help-seeking in their students.

General Discussion

The present studies demonstrate how students' help-seeking can be influenced by factors that act on attribution processes. Some of these factors, such as motivational set and teaching behaviors, represent variables that can be controlled through effective instruction and classroom management. For example, teachers can manage their classrooms in a way that promotes task-involvement, thereby encouraging instrumental help-seeking. Moreover, by presenting lectures which are clear, organized, and delivered skillfully, the teacher may be encouraging effective help-seeking strategies. These findings demonstrate that a number of identifiable teaching practises exist which can influence resource-use in students, and consequently can improve their chances for longterm success.

The effects of each of the above variables may depend on individual differences related to students' problem definition processes. The present studies suggest that students' generalized beliefs concerning the extent to which ability versus effort contribute to failure outcomes can moderate the influence of instruction variables. Students who generally emphasize the contribution of ability for failure are believed to have lower generalized efficacy expectations, and are more likely to perceive academic difficulties as severe, unchangeable, and affecting many areas of performance. On the other hand, students who place relatively more emphasis on effort are believed to have higher efficacy expectations, and generally perceive academic difficulties as less severe, changeable, and affecting only specific areas of performance. As a result of these differences in problem perception, students are affected differently by the instructional variables discussed above. First, under ego-involved conditions, low self-efficacy students engage in more executive help-seeking than high self-efficacy students. Second, the present studies provide preliminary evidence that effective teaching is associated with effective resource use in high, but not low self-

efficacy students. While tentative, these findings corroborate those of Perry and his associates (e.g. Perry & Dickens, 1984) who have shown experimentally that instructor expressiveness is unable to enhance achievement and associated cognitions in students who have low expectations of control over academic outcomes.

While the findings discussed above were predicted based upon the help-seeking model, some of the results were unexpected. The present section briefly discusses two of these findings, and their implications for further research. First, contrary to the model presented in the introduction, generalized low self-efficacy beliefs did not inhibit instrumental help-seeking. Second, ineffective teaching appears to influence students' use of resources not by lowering efficacy expectations, but rather by lowering outcome expectations. Each of these findings are discussed below.

According to the help-seeking model, low self-efficacy students were not expected to engage in instrumental help-seeking. It was presumed that their lack of confidence in their learning capabilities would inhibit their use of a help-source which required skill development. However, the present studies failed to support this hypothesis. In Study 1, self-efficacy scores failed to differentiate between users and nonusers of the instrumental help-source. Moreover, in Study 3 low self-efficacy students used the instrumental help-source to the same degree as high self-efficacy students. This pattern is consistent with a study reported by Magnusson and Perry (1989) in which failure attributions to ability was associated with instrumental help-seeking and giving-up.

These findings indicate that instrumental help-seeking may be influenced not so much by individual differences in students' stable attributions, but rather by situational factors and task-specific expectations. For example, Studies 2 and 3 demonstrated the significance of two situational factors with respect to instrumental help-seeking, namely effective teaching and motivational set. Thus, certain teaching behaviors and teaching practises

appear to affect students' task-specific efficacy beliefs, and these context-bound beliefs have inherently greater predictability than generalized beliefs. This explanation suggests that further research should be carried out using task-specific measures of efficacy, such as those employed by Schunk (e.g. 1981).

The model presented in Study 2 suggested that teaching effectiveness can influence students' use of resources by raising or lowering their efficacy expectations. That is, effective teaching produces higher performance expectations than ineffective teaching, and can therefore lead to more effective use of academic resources. However, findings from Studies 1 and 2 suggest that while effective teaching impacts on person-behavior beliefs, ineffective teaching influences behavior-outcome beliefs. For example, in Study 2, a canonical variate emerged which associated ineffective teaching with a low test grade, deemphasis of ability and effort, and emphasis of test difficulty and luck. Thus, students were attributing their poor performance to external factors, rather than ability and effort. Unfortunately, students were not asked to rate the contribution of ineffective teaching.

However, a teaching effectiveness item was included in Study 1. Findings from this study showed that, compared to high expressiveness, low expressive instruction caused students to attribute their performance to the quality of teaching. When considered with Study 2 results, these findings show that ineffective teaching lowers achievement, and causes students to attribute their performance to factors which reflect low outcome expectations, such as ineffective teaching and bad luck. These attributions show that students perceive little control over their achievement, not as a result of their lack of ability, but because no relation exists between their ability and the grade they receive.

Thus, the extent to which quality of teaching is perceived as a salient factor contributing to achievement depends upon whether it is effective or ineffective. When teaching is effective, students perform well and believe that their high achievement is due to their own

ability and effort. On the other hand, ineffective teaching lowers achievement and causes students to ascribe their poor performance to the quality of teaching. However, the degree to which these attribution patterns are related to achievement is difficult to determine based on evidence from the present studies. For example, if students receiving high quality teaching performed poorly, would they neverthless attribute their performance to ineffective teaching? Because level of achievement was not independently varied along with quality of instruction, this question can not be answered adequately.

With this caution in mind, one model which appears to account for the above findings is a discounting heuristic model. That is, as teaching quality deteriorates, its saliency as a causal factor increases. Thus, ineffective teaching causes students to focus on the behavior-outcome relation in order to determine a cause for their poor performance. As teaching becomes more effective, its role as a causal factor becomes less salient and students shift the focus of their attribution search to the person-behavior relation. According to this hypothesis, students receiving high quality instruction will attribute their poor performance to efficacy-related factors, rather than protect their self-worth by identifying another external factor. The coping strategies of these students would therefore reflect those associated with efficacy- rather than outcome-related beliefs.

Taken together, the preceding studies point toward the importance of instructional variables as they relate to effective use of academic resources. Within university settings, the responsibility for high achievement is often viewed as the students', thus diminishing the importance of effective teaching and classroom management. However, evidence is now available attesting to the contribution of effective teaching to student achievement. The present studies extend this research by examining specific achievement-related classroom behaviors which are influenced by instructional variables, thus clarifying the instruction-achievement relation. In particular, specific teaching behaviors and practises were shown

to produce effective use of resources in students, thereby elevating the probability of longterm success in the university setting. One important direction for further research is to determine the student cognitive processes which are influenced by these instructional variables, in order to understand why certain teaching variables are effective.

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Appendix A

The present Appendix contains items from the academic subscale of the Multidimensional-Multiattributional Causality Scale (Lefcourt et al., 1979).

Instructions

The following statements refer to academic issues, Since each statement has no correct or incorrect answer, please respond honestly to each one. Read each statement carefully, and respond to it by using the scale alternatives provided.

RECORD YOUR RESPONSES IN ITEMS 1 TO 24 IN SECTION 1 OF YOUR ATTITUDE ANSWER SHEET.

1.) When I receive a poor grade, I usually feel that the main reason is that I haven't studied enough for that course.

Disagree Agree
+----+----+----+----+
0 1 2 3 4

2.) If I were to receive low marks it would cause me to question my academic ability.

+----+----+----+----+
0 1 2 3 4

3.) Some of the times that I have gotten a good grade in a course, it was due to the teacher's easy grading scheme.

+----+----+----+----+
0 1 2 3 4

4.) Sometimes my success on exams depends on some luck.

+----+----+----+----+
0 1 2 3 4

5.) In my case, the good grades I receive are always the direct result of my efforts.

+----+----+----+----+
0 1 2 3 4

6.) The most important ingredient in in getting good grades is my academic ability.

+----+----+----+----+
0 1 2 3 4

7.) In my experience, one a professor gets the idea you're a poor student, your work is more likely to receive poor grades than if someone else handed it in.

+----+----+----+----+
0 1 2 3 4

8.) Some of my lower grades have seemed to be partially due to bad breaks.

+----+----+----+----+
0 1 2 3 4

9.) When I fail to do as well as expected in school, it is often due to a lack of effort on my part.

+----+----+----+----+
0 1 2 3 4

10.) If I were to fail a course it would probably be because I lacked skill in that area.

+----+----+----+----+
0 1 2 3 4

11.) Some of my good grades may simply reflect that these were easier courses than most.

+----+----+----+----+
0 1 2 3 4

12.) I feel that some of my good grades depend to a considerable extent on chance factors, such as having the right questions show up on an exam.

+----+----+----+----+
0 1 2 3 4

13.) Whenever I receive good grades, it is always because I have studied hard for that course.

+----+----+----+----+
0 1 2 3 4

14.) I feel that my good grades reflect directly on my academic ability.

+----+----+----+----+
0 1 2 3 4

15.) Often my poorer grades are obtained in courses that the professor has failed to make interesting.

+----+----+----+----+
0 1 2 3 4

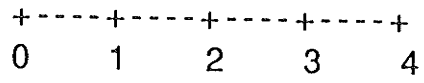
16.) My academic low points sometimes make me think I was just unlucky.

+----+----+----+----+
0 1 2 3 4

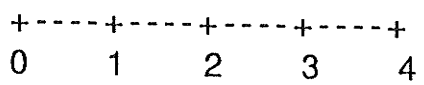
17.) Poor grades inform me that I haven't studied hard enough.

+----+----+----+----+
0 1 2 3 4

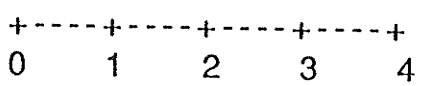
18.) If I were to get poor grades I would assume that I lacked ability to succeed in those courses.



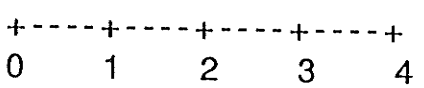
19.) Sometimes I get good grades only because the course material was easy to learn.



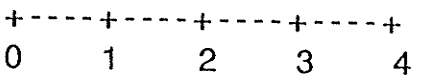
20.) Sometimes I have to feel that I have to consider myself lucky for the good grades I get.



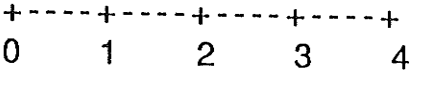
21.) I can overcome all obstacles in the path of academic success if I work hard hard enough.



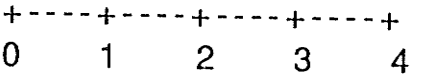
22.) When I get good grades, it is because of my academic competence.



23.) Some of the low grades I have received seem to me to reflect the fact that some teachers are just stingy with marks.



24.) Some of my bad grades may have been a function of bad luck, being in the wrong course at the wrong time.



Appendix B

The following pages contain the instructions and Take-Home Assignment used in Study 1.

Instructions

This brief assignment is given so that you can take it with you to complete at your leisure. You can either complete it immediately, or return it sometime within the week. You will receive your experimental credit when you turn the assignment in to the experimenter. The details of receiving your credit will be explained fully to you at the end of this session. Since assignments must be completed satisfactorily (i.e. all questions attempted) in order to receive credit, allowing you to complete the assignment at your leisure will ensure that you earn your credit.

To help you, two types of services will be provided for you. First, a teaching assistant (T.A.) will be available throughout the week to answer any questions and discuss any issues of concern. You can either make an appointment to visit the T.A., or arrange to meet during office hours, which will be announced at the end of the session.

Second, resource materials on the lecture topic have been placed on reserve in the library, and these can be accessed at any time. To ensure that everyone who wants to will be able to meet with the T.A. or use the materials, we will later determine the number of students we need to accomodate.

TAKE-HOME ASSIGNMENT

BRIEFLY answer the following questions (one or two paragraphs):

1.) Differentiate repression from forgetting and from suppression.

2.) What are the three principles which relate repression to a learning phenomenon?

3.) Briefly describe an experiment which provides evidence of repression.

4.) What is the adaptive value of repression?

5.) What are two ways by which repression can hurt you?

6.) How can you overcome repression?

Appendix C

The present section contains the Instructor Rating Scale, on which students rated the frequency of various low-inference behaviors of their Introductory Psychology instructor in Study 2.

Instructor Rating Scale

For this questionnaire, you are asked to rate how often your Introductory Psychology instructor uses various teaching techniques or exhibits various behaviors (0=never, 4=very often). Your ratings will be ANONYMOUS and CONFIDENTIAL. These ratings are for research purposes only and will not be made available to faculty members or administration.

BEGIN WITH SECTION 1, ITEM 25.

HOW OFTEN DOES YOUR PSYCHOLOGY PROFESSOR:

	Never				Very Often
25. Use concrete examples.	0	1	2	3	4
26. Give multiple examples.	0	1	2	3	4
27. Repeat difficult ideas.	0	1	2	3	4
28. Ask questions of class as whole.	0	1	2	3	4
29. Suggest practical applications.	0	1	2	3	4
30. Use graphs and diagrams.	0	1	2	3	4
31. Stress important points.	0	1	2	3	4
32. Suggest ways to help you remember material.	0	1	2	3	4
33. Show a strong interest in subject.	0	1	2	3	4
34. Fail to take initiative in class.	0	1	2	3	4
35. Show concern for students.	0	1	2	3	4

36. Use humour.	0	1	2	3	4
37. Speak expressively or emphatically.	0	1	2	3	4
38. Show facial expressions.	0	1	2	3	4
39. Move about while lecturing.	0	1	2	3	4
40. Read lecture verbatim from notes.	0	1	2	3	4
41. Show energy and excitement.	0	1	2	3	4
42. Smile or laugh.	0	1	2	3	4
43. Gesture with hands and arms.	0	1	2	3	4
44. Avoid eye-contact with students.	0	1	2	3	4
45. Speak softly.	0	1	2	3	4
46. Ask questions of individual students.	0	1	2	3	4
47. Address students by name.	0	1	2	3	4
48. Provide opportunity for participation.	0	1	2	3	4
49. Encourage questions and comments.	0	1	2	3	4
50. Praise students for good ideas.	0	1	2	3	4
51. Present thought-provoking ideas.	0	1	2	3	4
52. Talk with students after class.	0	1	2	3	4
53. Speak in monotone.	0	1	2	3	4
54. Digress from topic of lecture.	0	1	2	3	4

55. Proceed at a rapid pace.	0	1	2	3	4
56. Dwell on obvious points.	0	1	2	3	4
57. Signal transition to new topics.	0	1	2	3	4
58. Advise students regarding tests.	0	1	2	3	4
59. Use headings and subheadings.	0	1	2	3	4
60. Give preliminary overview of lecture.	0	1	2	3	4
61. Explain how each topic fits in.	0	1	2	3	4
62. State teaching objectives.	0	1	2	3	4
63. Put outline of lectures on board.	0	1	2	3	4

Appendix D

The following pages contain the items used to assess students' preferred coping strategies in Study 2. Each strategy is linked with a specific resource common to university settings.

Imagine a situation in which you are experiencing considerable difficulty completing an assignment for your Introductory Psychology course. Indicate how likely you are to:

	Never				Very Often
64. Complete what you can and then exchange answers with a friend?	0	1	2	3	4
65. Ask the instructor for clarification of a point made during class?	0	1	2	3	4
66. Form a study group or review session to help participants understand the material better?	0	1	2	3	4
67. Use the library to look for supplementary books related to the difficult material?	0	1	2	3	4
68. Use tutoring services to improve your skills in a particular area?	0	1	2	3	4
69. Ask the T.A. for the answer to one of the problems?	0	1	2	3	4
70. Continue working on the assignment without asking for help or using supplementary reference material?	0	1	2	3	4
71. Ask friends for a completed assignment from a previous year?	0	1	2	3	4
72. Use reference materials to help you understand the course material better?	0	1	2	3	4

73. Only complete that portion of the of the assignment which you understand, and hand it in incomplete?	0	1	2	3	4
74. Ask a friend to help you complete the assignment?	0	1	2	3	4
75. Consider withdrawing from the course?	0	1	2	3	4
76. Consult with the T.A. to clarify course material?	0	1	2	3	4

Appendix E

The following pages contain the Analytical Reasoning task used in Study 3.

Analytical Reasoning

The following section contains four sets of Analytical Reasoning problems, with five problems in each set. Each group of questions is based on a short passage or a set of propositions. When you have selected the best answer to each question, darken the corresponding circle on your response-sheet. You may refer to your HELPFUL HINTS for questions 6 to 15.

A.) A construction company is building a pre-fabrication structure which requires specialized crane operators for five different parts of the job. Six operators are available: R, S, T, U, V, and W, and each phase will take one day and will be done by a single operator. Though an operator may do more than one phase of a job, no operator will work two days in a row.

Both R and S can handle any phase of the job.
T can work only on days immediately following days on which S has worked.
U can work only on days that T can.
V can work only on the third and fifth days of the job.
W can work only on the fourth day of the job.

1.) Which of the following are true?

I. R could do up to three phases of the job.
II. S could do up to three phases of the job.
III. T could do no more than two phases of the job.

a.) I only
b.) II only
c.) III only
d.) II and III only
e.) I, II, and III

2.) If S works on the first day of the job, which of the following is/are true?

I. Only T or U can work the second day.
II. T, U, or R could work the second day.

III. R, S, or W could work the third day.
   a.) I only
   b.) II only
   c.) III only
   d.) I and III only
   e.) I, II, and III

3.) If R works the first day, which of the following is/are true?

I. S must work on the second day.
II. S cannot work on the third day.
III. Only T, U, or V can work on the third day.
   a.) I only
   b.) II only
   c.) I and II only
   d.) I and III only
   e.) I, II, and III

4.) If R works on both the first and third days, which of the following most accurately describes the possibilities on the fourth day?

   a.) Only S is eligible to work.
   b.) Only R, S, T, or W are eligible to work.
   c.) Only S or W are eligible to work.
   d.) Only R, S, or W are eligible to work.
   e.) Only S, T, U, or W are eligible to work.

5.) R, S, and V do not work on the third day, therefore
   a.) R worked on the first day.
   b.) Only S can work on the fourth day.
   c.) Only R can work on the fourth day.
   d.) Only W can work on the fourth day.
   e.) Either T or U worked on the second day.

NOTE: FOR QUESTIONS 6 TO 16 YOU MAY USE THE 'HELPFUL HINTS' SHEET

B.) Paul, Quincy, Roger, and Sam are married to Tess, Ursula, Valerie, and Wilma, not necessarily in that order. Roger's wife is older than

Ursula. Sam's wife is older than Wilma, who is Paul's sister. Tess is the youngest of the wives. Roger was the best man at Wilma's wedding.

6.) If Quincy and his wife have a boy named Patrick, then
   a.) Tess will be Patrick's aunt
   b.) Valerie will be Patrick's aunt
   c.) Paul will be Patrick's cousin
   d.) Ursula will be Patrick's mother
   e.) none of the above

7.) Which of the following is true?
   a.) Roger's wife is younger than Valerie
   b.) Roger's wife is younger than Wilma
   c.) Paul's wife is younger than Ursula
   d.) Sam's wife is older than Valerie
   e.) Quincy's wife is older than Ursula

8.) If each husband is exactly two years older than his wife, which of the following must be false?
   a.) Roger is older than Ursula
   b.) Tess is younger than anyone
   c.) Paul is younger than Sam
   d.) Quincy is younger than Paul
   e.) Valerie is younger than Paul

9.) If the wives were -- from youngest to oldest -- 28, 30, 32, and 34 years old; and Paul, Quincy, Roger, and Sam were respectively 27, 29, 31, and 33 years old, which of the following must be false?
   a.) Tess is older than her husband
   b.) Valerie is older than her husband
   c.) Ursula is younger than Valerie's husband
   d.) Wilma is younger than Ursula's husband
   e.) Tess is younger than Wilma's husband

10.) If Tess and Valerie got divorced from their current husbands and marry each other's former husband, then
   a.) Sam's wife will be younger than Paul's wife
   b.) Sam's wife will be younger than Roger's wife
   c.) Roger's wife will be older than Quincy's wife

d.) Roger's wife will be older than Paul's wife
e.) Paul's wife will be younger than Quincy's wife

C.) The parties to an important labor negotiation are two representatives of management, Morrison and Nelson; two representatives of labor, Richards and Smith; and the federal mediator Jones. They are meeting at a round table with eight seats, and the order of the seating has become a significant psychological part of the negotiations.

I. The two representatives of management always sit next to one another.
II. The two representatives of labor always sit with one seat between them.
III. Both sides like to make sure that they are as close to the mediator as the other side, and no closer to the opposing side than necessary.
IV. The mediator prefers to have at least one seat between himself and any of the other negotiators.

11.) If conditions I, II, and IV are met, which of the following is necessarily true?
a.) Jones sits next to one of the management representatives
b.) Morrison sits next to one of the labor representatives
c.) One of the labor representatives will sit next to either Morrison or Nelson
d.) Either Richards or Smith sits next to Jones
e.) None of the above is necessarily true

12.) If conditions I, II, and III are met, which of the following is NOT a possible seating arrangement of the negotiators, starting with Jones and going clockwise around the table.
a.) Jones, Morrison, Nelson, empty, empty, Richards, empty, Smith
b.) Jones, Nelson, Morrison, empty, empty, Smith, empty, Richards
c.) Jones, Richards, empty, Smith, empty, empty, Nelson, Morrison

d.) Jones, Smith, Richards, empty, empty, empty, Morrison, Nelson

e.) All of the above are possible seating arrangements

13.) The Secretary of labor joins the negotiations and sits across the table from the mediator. If all the conditions are met as much as possible, which of the following is true?

I.) A labor representative will sit next to the secretary
II.) A management representative will sit next to the secretary
III.) Both a labor representative and one from management will sit next to the mediator

a.) I only
b.) II only
c.) I and II only
d.) I and III only
e.) I, II, and III

14.) If the two sides meet without the mediator and sit so that Morrison is seated directly opposite to Smith, which of the following is possible?

a.) Richards and Nelson will both be seated to Morrison's left and to Smith's right
b.) Richard's will be as close to Morrison as he is to Smith
c.) Nelson will be separated from Richards by one seat
d.) Nelson will be separated from Smith by three seats
e.) Nelson and Richards will be seated directly across from each other

15.) If, under the original conditions, Morrison's aide joins the negotiations and sits next to Morrison, which of the following is not possible?

a.) Richards sits directly opposite Morrison
b.) Richards sits directly opposite Morrison's aide
c.) Smith sits directly opposite Nelson
d.) Smith sits directly opposite Morrison's aide
e.) Morrison's aide sits next to Jones

NOTE: FOR QUESTIONS 16 TO 25 PLEASE TURN OVER
YOUR 'HELPFUL HINTS' SHEETS

D.) Jack Caribe, the ocean explorer, is directing a study of the parrat fish, an important part of coral reef ecology. Each day he must schedule the diving teams. His creq consists of four professional scuba divers -- Ken, Leon, Matel, and Nina -- and four marine biologists -- Peter, Quentin, Rosemary, and Sue.

Noone can dive more than twice a day and a professional diver must always be on the boat as the dive-master. Jack is not assigned but can do any task he wishes, including dive-master.

Each dive team must have at least one professional diver and one biologist.

Mabel and Peter have fought, and Jack won't put them together for now. Mabel, a strong swimmer, works very badly with slow-paced Quentin.

Sue and Ken are recently married and always dive together.

16.) If Nina is a dive-master supervising three diving teams, which of the following is NOT a possible dive team?

a.) Ken, Sue, and Peter
b.) Ken, Sue, and Quentin
c.) Leon, Peter, and Quentin
d.) Leon, Peter, and Rosemary
e.) Mabel and Rosemary

17.) If Jack is the dive-master with four teams diving, how many different possible two-diver teams are there?

a.) 6
b.) 7
c.) 8
d.) 9
e.) 10

18.) If Mabel is the dive-master, which of the following is NOT a possible dive team?

I. Peter, Quentin, and Rosemary
II. Leon and Nina
III. Ken, Sue, and Quentin
IV. Ken, Peter, and Rosemary

a.) I and II only
b.) I, II, and III only

c.) I, II, and IV only
d.) III only
e.) I, II, III, IV

19.) If biologist Olga joins the expedition and Leon is away getting supplies, which of the following is a possible schedule for the morning dive teams?

a.) Ken, Sue, and Peter; Nina, Rosemary, Peter, and Olga; Nina, Jack, and Quentin
b.) Ken, Mabel, and Sue; Nina, Rosemary, Peter, and Olga
c.) Ken, Olga, and Quentin; Rosemary, Sue, and Mabel
d.) Olga, Rosemary, and Peter; Ken and Sue; Nina and Peter
e.) Mabel, Olga, and Peter; Ken, Sue, and Quentin; Nina, Jack, and Rosemary

20.) If Peter and Mabel become friends again and Leon is the dive-master, which of the following is a possible diving team?

a.) Peter, Mabel, and Ken
b.) Peter, Mabel, and Sue
c.) Peter, Quentin, and Rosemary
d.) Peter, Mabel, Ken, and Sue
e.) Mabel, Sue, and Rosemary

E.) Six persons, J, K, L, M, N, and O, run a series of races with the following results.

I. O never finishes first or last
II. L never finishes immediately behind either J or K
III. L always finishes immediately ahead of M

21.) Which of the following, given in order from first to last, is an acceptable finishing sequence of the runners?

a.) J, L, M, O, N, K
b.) L, O, J, K, M, N
c.) L, M, J, K, N, O
d.) L, M, J, K, O, N
e.) N, K, L, M, L, J

22.) If, in an acceptable finishing sequence, J and K, finish first and fifth respectively, which of the following must be true?

a.) L finishes second
b.) O finishes third
c.) M finishes third
d.) N finishes third
e.) N finishes sixth

23.) If, in an acceptable finishing sequence, L finishes second, which of the following must be true?

I. O must finish fourth
II. N must finish fifth
III. Either J or K must finish sixth

a.) I only
b.) II only
c.) III only
d.) I and III only
e.) I, II, and III

24.) All of the following finishing sequences, given in order from 1 to 6, are acceptable EXCEPT

a.) J, N, L, M, O, K
b.) J, N, O, L, M, K
c.) L, M, J, M, O, K
d.) N, J, L, M, O, K
e.) N, K, O, L, M, J

25.) Only one acceptable finishing sequence is possible under which of the following conditions?

I. Whenever J and K finish second and third respectively
II. Whenever J and K finish third and fourth respectively
III. Whenever J and K finish fourth and fifth respectively

a.) I only
b.) II only
c.) III only
d.) I and II only
e.) I, II, and III

Appendix F

The following pages contain the format for the executive and instrumental "Helpful Hints" sheets. In Study 3, the hints on each sheet were printed in invisible ink, and students had to use a special marking pen to reveal each hint.

(Executive help)

HELPFUL HINTS

6.) (NOT D) (NOT B) (NOT E) (NOT C)

7.) (NOT B) (NOT D) (NOT E) (NOT A)

8.) (NOT C) (NOT E) (NOT A) (NOT B)

9.) (NOT E) (NOT D) (NOT B) (NOT A)

10.) (NOT B) (NOT D) (NOT E) (NOT C)

11.) (NOT D) (NOT E) (NOT A) (NOT B)

12.) (NOT E) (NOT B) (NOT A) (NOT C)

13.) (NOT A) (NOT E) (NOT B) (NOT C)

14.) (NOT A) (NOT D) (NOT C) (NOT E)

15.) (NOT D) (NOT C) (NOT B) (NOT E)

(Instrumental help)

HELPFUL HINTS

1.) The "TABLE METHOD" is the most general strategy for solving these types of problems. Simply list all the different kinds of information which you expect to have to arrange, and enter each item, checking it against every other entry. ALWAYS make a table or diagram for yourself.

2.) The following is one example of the TABLE METHOD:

I. There are three sailors, F, G, H, who are a bosun, gunner, and cook on ships 101, 201, and 301, not necessarily in that order.

II. G and H are in a different navy than F, but in the same navy as each other.

III. Yesterday, the bosun was transfered from ship 101, where he was serving with the gunner, to ship 201.

1.) Who serves on ship 301?
2.) The rank of which sailor(s) is(are) unknown?

STEP 1: From info given

NAME:	F	G	H
RANK:		gunner or	bosun
BOAT:		101 or	201
NAVY:	different	same	same

STEP 2: Inferred

NAME:	F	G	H
RANK:	cook	gunner or	bosun
BOAT:	301	101 or	201
NAVY:	different	same	same

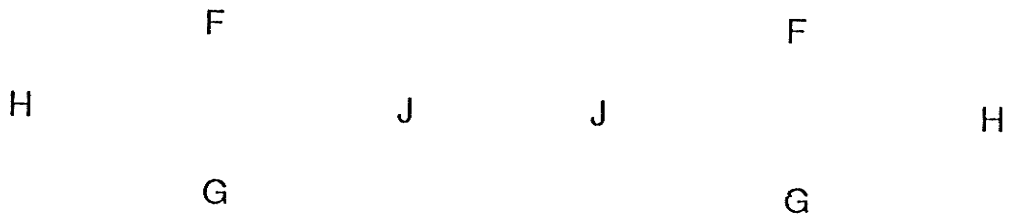
Therefore, F serves on ship 301 and the ranks of G and H are not definitely known.

3.) Sometimes the TABLE METHOD is not as fast or simple as a diagram. For example, if you were given the following information:

I. F, G, H, and J are sitting at a four sided table, one at each side.

II. F is opposite G and H is opposite J.

Then you could diagram the two basic arrangements:



Since you know that F can be sitting in one of four possible seats, there are 4 (seats) x 2 (arrangements) = 8 possible seating arrangements.

4.) If you use a DIAGRAM rather than a TABLE, make sure that you do not enter an item into the diagram, unless there is something to LINK with it. Information presented early is sometimes best diagrammed later if the later information provides a link.

Appendix G

The questionnaire presented in the following pages was used to assess students' achievement attributions after their performance on the Analytical Reasoning Task in Study 3.

Post-Test Questionnaire

Instructions:

The following questions pertain to the test you just completed. We would like some information about your opinions on the test.

Below are words or phrases at each end of a 9-point scale. Please select the number on the scale which represents your opinion. Place your responses on the computer-scored answer sheets.

NOTE: FOR THIS QUESTIONNAIRE, PLEASE USE NUMBERS 25 THROUGH 33 IN SECTION 1 OF THE ATTITUDE SURVERY ANSWER SHEET TO RECORD YOUR RESPONSES.

1.) How much ABILITY do you think you have for this type of test?

None At All — A Great Deal

-4 -3 -2 -1 0 1 2 3 4

2.) How much is your rating on the previous item based on your own progress on the task (-4) versus how well you performed compared to others (+4).

Own Progress — Progess of Others

-4 -3 -2 -1 0 1 2 3 4

3.) How HARD DID YOU TRY to answer the questions on the test?

Did Not Try At All — Tried My Hardest

-4 -3 -2 -1 0 1 2 3 4

4.) How DIFFICULT did you feel the aptitude test was?

Very Easy — Very Difficult

-4 -3 -2 -1 0 1 2 3 4

5.) How SUCCESSFUL did you feel at the end of the test?

Not At All Successful						Very Successful		
-4	-3	-2	-1	0	1	2	3	4

6.) How much did YOUR ABILITY determine your performance on this test?

Not At All						Entirely		
-4	-3	-2	-1	0	1	2	3	4

7.) How much did YOUR EFFORT to solve the questions determine your performance on the achievement test?

Not At All						Entirely		
-4	-3	-2	-1	0	1	2	3	4

8.) How much did the DIFFICULTY OF THE TEST determine your performance on the test?

Not At All						Entirely		
-4	-3	-2	-1	0	1	2	3	4

9.) How much did LUCK determine your performance on the test?

Not At All						Entirely		
-4	-3	-2	-1	0	1	2	3	4