

Effects of Integrated Motivational and Volitional Tactics on Study Habits,  
Attitudes, and Performance

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## Abstract

A continuing challenge is how to stimulate and sustain learner motivation and persistence in undergraduate general education courses. Most controlled research studies do not generalize to this setting because they typically implement treatments of 30 to 50 minutes so that they can be completed in a single class period (Azevedo & Cromley, 2004). The challenges to motivation that occur during a semester-length course or a significant portion of the course are much different from a “single sitting” research study in which there is hardly time to overcome the novelty effects of an intervention before the experiment is finished. Also, in a longer study, the motivational factors that are present at the beginning of a learning experience cannot be expected to persist over a long period of time unless other things are done to help sustain learner motivation and persistence. The present study took place over a four-week module in a large undergraduate course and incorporated a variety of tactics designed, in accordance with supporting theories, to assist students in maintaining their motivation and self-regulatory habits during this period of time. To provide a means for the rational selection and creation of motivational and volitional tactics, the ARCS model (J. M. Keller, 1987, 2004) of motivational design was expanded to incorporate the volitional theories of Gollwitzer (1999) and Kuhl (1987). The effectiveness of this approach was tested by distributing the strategies as “motivational messages” (Visser & Keller, 1990) in the form of “Study Tips” via email to the participants in this study. The primary finding was that students who opened the study tips emails increased their study time, maintained confidence, and improved their test scores compared to those who did not open them. This has positive implications for sending motivational and volitional study tips directly to students while they are in the process of studying a course.

## Introduction

### Background

Historically, motivation was considered to have two levels. The first is “will,” which refers to a person’s desires, wants, or purposes together with a belief about whether it is within one’s power to satisfy the desire, or achieve the goal (James, 1890; Paul R. Pintrich & Schunk, 2002). The second level is the act of using the will, or “volition,” which refers to a process for converting intentions into actions. In some cases, the mere saliency of a desire is sufficient to lead more or less automatically to action, but often, as William James (1890) pointed out, it is necessary to have a conscious effort supported by determination or extrinsic requirements to convert intentions into action.

Much of motivation research has focused on understanding what people’s goals are and why they choose them. For example, the original conceptualization of “will” as being a combination of desires and beliefs about being able to achieve them is reflected in expectancy-value theory which postulates that behavior potential is a function, assumed to be multiplicative, of the perceived importance of a given goal in relation to other goals (value) and one’s subjective probability of being able to achieve the goal (expectancy). While this theory has had a powerful influence in motivational theory, its sole contribution is in explaining how people choose a particular goal or set of goals. It does not fully explain volition, or what impels people to action and keeps them working persistently to achieve a goal. Consequently, a distinction between “selection motivation” and “realization motivation” has to be made (Kuhl, 1985). Modern conceptions of volition such as action control (Kuhl, 1987), implementation intentions (Gollwitzer, 1999), as well as work on self-regulation (Zimmerman, 1998a) are based upon this distinction. All of these pertain to the problem of maintaining goal-oriented behavior and overcoming discouragement and attrition, problems that have been experienced especially in self-directed learning environments including e-learning, and even classroom courses that put a high level of scheduling control into the students’ hands or in which there are large numbers of students who are taking the course to meet a requirement.

Kuhl (1985) defines volition as a mediating factor that “energizes the maintenance and enactment of intended actions” (Kuhl, 1985, p. 90) and therefore goes beyond motivation. In other words, strong motivation is a necessary yet not a sufficient condition. Wolters (1998) commented about how students can express strong desires to accomplish a goal but have a very difficult time in managing competing goals and distractions that interfere with their academic work. Similarly, Pintrich and Garcia (1994) pointed out that the influence of volition becomes even more important for college students “who, when you talk to them, are very motivated and concerned about doing well, but often have a very difficult time enacting their intentions, given all the internal and external distractions they confront in college life” (p. 126f). These observations are, of course, readily apparent to anyone, teachers or counselors, who try to facilitate change in people. The interesting point is that this phenomenon has been coming under greater and greater scrutiny in psychological research. Kuhl’s action control theory was developed to bridge

the intention-behavior gap and to help people overcome maladaptive behaviors in their life. Even though his theory is only recently being applied to learning environments and has not yet been applied in multimedia settings, it has served as a foundation for the work of Zimmerman (1998b) and Corno (2001) who study volitional behaviors in self-regulated learning.

In the theory of action control, Kuhl (1987) specifically addresses the question of what factors influence a person's continued and persistent efforts to accomplish a goal. Kuhl's theory postulates six action control strategies which can be employed as soon as an action tendency achieves the status of a current intention (by committing to the action). In other words, commitment to achieving a given goal is a prerequisite to employing the set of action control strategies, which are:

1. Selective attention: also called the "protective function of volition" (Kuhl, 1984, p. 125): it shields the current intention by inhibiting the processing of information about competing action tendencies.
2. Encoding control: facilitates the protective function of volition by selectively encoding those features of incoming stimulus that are related to the current intention and ignoring irrelevant features.
3. Emotion control: managing emotional states to allow those that support the current intention and suppress those, such as sadness or attraction, in regard to a competing intention that might undermine it.
4. Motivation control: maintaining and reestablishing saliency of the current intention, especially when the strength of the original tendency was not strong ("I must do this even though I don't really want to.")
5. Environment control: Creating an environment that is free of uncontrollable distractions and making social commitments, such as telling people what you plan to do, that help you protect the current intention.
6. Parsimonious information processing: Knowing when to stop, making judgments about how much information is enough and to make decisions that maintain active behaviors to support the current intentions.

Kuhl assumes that processes of action control underlie virtually any kind of activity, but especially those in which the person faces difficulties and hindrances. The effectiveness of employing action control strategies has been confirmed in many studies in a variety of behavior change settings (Kuhl, 1987) as well as in educational settings (Corno, 2001; Kuhl, 1984; Zimmerman, 1998a). However, action control theory does not provide detailed examination of intention commitment, or implementation intentions. For this, Gollwitzer's work (Gollwitzer, 1999) on volition is helpful.

The first step in moving from desire to action, that is, from the identification and acceptance of a personal goal to a set of actions to accomplish the goal is that of intention formation. On the one hand, the concept of "good intentions" is used as a rationalization when things go wrong, or an excuse for not taking action as in the expression, "the road to hell is paved with good intentions." But, on the other hand, intentions can be a powerful influence on goal accomplishment. In a laboratory study with preschool children who were asked to work on a repetitive, boring task that was interrupted with a tempting distraction (a clown head encouraging children to select and play with toys instead of working on their assigned task), Patterson and Mischel (Patterson & Mischel, 1976) tested the effects of task-facilitating intentions versus temptation-inhibiting intentions. The children were told that a clown box might tempt them to stop working. The task-facilitating group was told to keep their attention on the task if this happened, and the temptation-inhibiting group was told to direct their attention away from the clown box. This study and subsequent research (Gollwitzer & Schaal, 2001) shows that temptation-inhibiting intentions have the superior effect no matter whether motivation to perform the task is high or low.

Adding volition to the motivational design process may be of particular benefit to students in large undergraduate lecture courses in which many of the students are enrolled to fulfill a general education requirement rather than being in their major area of interest. Problems in these courses include such things as procrastination, ineffective study habits, lack of perceived relevance of the content to their lives, low personal priority for the course requirements, and not knowing how to build resistance against distractions that occur during their available time for study. The work of Zimmerman (1998a), Corno (1993), and others on self-regulation has had some success in improving volitional behaviors, but the problems persist, especially when one moves outside the controlled study environment to an actual classroom.

Another major issue in research on self-regulated learning pertains to the availability of volitional strategies. Previous research findings indicate that learners do not possess adequate strategies to deal with outside or inside interferences (Bannert, 2004). Therefore, providing learners volitional strategies can help in establishing volitional competence. Moreover, much of the previous research in the areas of motivation and volition deals with isolated aspects of attitudes and behavior instead of being grounded in a more holistic theory of motivation and volition. Also, the interventions tend to be presented at the beginning of the treatment (e.g. Azevedo & Cromley, 2004). The present study, in contrast to this research, expands the ARCS model of motivational design to include volitional design, and also distributes strategies in two different ways. One approach was to bundle all of the strategies, called 'Study Tips', into one booklet and send it as an email attachment at the beginning of the treatment

period. The second approach was to distribute the strategies throughout the four-week treatment period via email at those times when the strategies would be most likely to be immediately useful. We also included a placebo group which received messages with information and humor that was related to the topic of the course but tangential to its formal content and tests. The purpose of having a placebo group was to control for potential reactive effects that might result from the novelty of sending numerous and diverse emails to the class, regardless of their content. It is common in studies of motivation to fail to control for novelty effects, but in this study all three treatment groups received the placebo messages to determine whether the designed motivational and volitional messages in the distributed and bundled treatments had an effect independently of the novelty influences.

In summary, the purpose of this study was to test the effectiveness of a combined set of motivational and volitional strategies on the motivation and persistence of a group of undergraduate students in a general education course that satisfies one of their curricular requirements. It was expected that the blending of motivational and volitional strategies and distributing them at the most appropriate times would result in higher levels of improvements in study habits, attitudes toward the course, and learning performance than when bundled and distributed all at once in a booklet, but that both of these treatments would be superior to the placebo group.

## Method

### Participants

Participants in this study were 90 of the 115 students in an undergraduate archaeology course who indicated their willingness to participate by filling out a pre-treatment questionnaire of study habits, volitional habits, and course-specific motivational attitudes. Twenty-five of the original participants were eliminated because they failed to return 3 or more of the 10 weekly logbooks.

### Research Design

In the first set of analyses, there was one independent variable, message type, with three levels: bundled messages, distributed messages, and placebo. For the second set of analyses, there was one independent variable, study tip use, with two levels: opened study tips versus unopened study tips. Repeated measures analyses were conducted in both sets of analyses because pre- and post-measures were taken on each of the dependent variables consisting of study habits as measured by study time, three components motivational attitudes toward the course (interest, relevance, and confidence) as measured by the appropriate scales in the Course Interest Survey (Keller & Subhiyah, 1993), and achievement as measured by test grades.

### Variables, Measures, and Analysis

There were two independent variables in this study, and they were used in two separate sets of analyses. The first one, message type, refers to the way messages were assembled and distributed to the students. Six messages containing combinations of motivational and volitional messages were prepared. For the “bundled” group, all six messages were assembled into a booklet and sent by email to the learners in that group shortly after the first test was given. For the second group, the ‘distributed’ group’, the messages were sent at intervals based on the researchers’ expectations of the kinds of motivational and volitional support the students might benefit from at those times. Finally, a set of placebo messages was prepared and distributed to the control group, the ‘placebo’ group together with the bundled and distributed groups.

After the second test was given, which concluded the treatment period for this study, the students in the bundled and distributed groups were asked if they opened the study tips attachments to look at them. An unexpected result was that fewer than half of the participants did so. Therefore, the researchers decided to add an ad hoc independent variable which was study tip use with two levels consisting of those who looked at the study tips and those who did not. Since the means of the two groups were almost identical ( $M_{\text{bundled}} = 1.68$ ;  $M_{\text{distributed}} = 1.67$ ) with respect to how many opened the study tips (1 = yes; 2 = no) the distinction between bundled and distributed was not used in the analyses of this independent variable.

The first dependent variable was Study Time. Based on the self-reported data in the participant logbooks which were submitted by weekly email, the study time prior to the first test was compared to the study times from the first to the second test. Participants reported time spent studying the text and time spent on a special project assigned to the class. These were summed to compute total study time.

The second dependent variable was measured by using the attention, relevance, and confidence subscales from the Course Interest Survey. The satisfaction scale was not used because it was not pertinent to this particular study. This CIS is a situation-specific survey which has satisfactory reliability estimates as measured by Crohbach's alpha formula ( $r_{\text{attention}} = .84$ ,  $r_{\text{relevance}} = .84$ ,  $r_{\text{confidence}} = .81$ ). Each of these subscales was used as a separate measure.

The third dependent measure was test grade on Test 1 compared with Test 2. These tests were those used by the instructor in the normal process of teaching and assessing. The researchers did not modify the tests and were not present when they were administered.

All of these analyses were conducted with repeated measures using the general linear model to control for differences in the pre-treatment scores and to determine whether there were significant shifts within and between groups. Even though there were multiple dependent variables, MANOVA was not considered given that this was an exploratory study and the number of participants would not support it. Also, for these same reasons, a confidence interval of .10 was chosen in place of the customary .05. The findings of this study will provide a basis for future, more tightly controlled studies.

## Materials

The materials used in this study for collecting data consisted of weekly logbooks that were sent to the participants by email and which were returned via email by the participants to the researchers. The researchers set up a second course website using Blackboard, which is the system used by this university. It was identical to the instructor's primary website except that she did not have access to it. Thus, the participants were assured of confidentiality in their responses. The lead researcher had access to the instructor's website in order to get copies of grades.

Study tips were created in accordance with the motivational and volitional strategies that were selected for use with these participants. These decisions were based upon audience information obtained from interviews with the course instructor and her graduate student, as well as the researcher's knowledge of relevant research and direct experience with similar audiences. A total of six strategies were produced. Each of these consisted of two or more pages of information and graphics. All of them were put together into one package for the bundled group and kept separate for the distributed group. The only other difference between the two groups was that in the emails that contained these strategies there were slightly different comments due to the bundled versus distributed situations. The titles, motivational and volitional focus, and brief explanatory comments are contained in Table 1.

## Procedure

On the first day of class, the researchers and two additional persons attended to pass out and collect a survey of study habits and attitudes and course-specific motivation. Participation was voluntary. If students filled out and returned the questionnaires, it indicated their willingness to participate. These measures were not used in the present study. Also, this was the only time the researchers had face-to-face contact with the class.

Beginning immediately after Week 1, logbooks were sent to students each week. The contents always included questions about time spent studying. Some logbooks contained other questions pertaining to motivation and other attitudes.

The logbook that was distributed at the end of the third week class asked for study times and also asked about motivational attitudes (interest, relevance, and confidence). These served as the pre-measures for this study. The first test was given during the following (fourth) week of class.

The logbook that was distributed at the end of the seventh week class once again asked for study times and also asked about motivational attitudes (interest, relevance, and confidence). These served as the post-measures for this study. The second test was given during the following (eighth) week of class.

One week after the second test, all students in the class, including the placebo group and non-participants, were informed about the study tips and how to access them on the website. This was to control for the potential ethical problem of one group receiving a favored treatment and to assist interested students in preparing for the final two tests and term project.

Table 1 Study tip descriptions, focus, and comments

Study Tip Titles	Motivational/Volitional Focus	Comments
The Stages of Learning	Motivation (helping to stimulate interest, establish relevance, and build confidence) Volition (pre-actional planning, anticipating action control requirements, and pre-reflection)	This was a motivational document that covered the key elements of motivation and volition in a way designed to stimulate learner interest and provide guidance on how to sustain it.
Future Wheel: The Issue of Relevance	Relevance	This was a primary motivational challenge (gap) among the students.
Making a Plan that Works!	Volition (pre-actional planning, environment control, emotion control, and motivation control)	Concrete guidance for how to plan for an effective study environment, develop attitudes of commitment, and manage emotions to maintain study commitments.
Tips for Studying Text	Volition (selective attention, environment control, encoding control, parsimonious information processing)	This study tip includes concrete advice on how to study complex textual material, especially when it is not intrinsically interesting.
Overcoming Discouragement	Volition (selective attention, encoding control, and maintaining motivation)	This tip addresses the problems students face from being overloaded, procrastinating, or both.
Making Anxiety Work for You	Motivation and volition (rebuilding or maintaining expectancies, emotion control, motivation control, and environment control)	Building confidence and reducing anxiety caused by fear of failure.

## Results

There were two sets of analyses. The first was based on the first independent variable which was message type. Based on the repeated measures analyses, there were no significant differences among the three message type groups with respect to study time, interest, relevance, or test scores. With respect to confidence, there were no significant differences between groups, but the mean confidence level decreased significantly,  $F(1,76) = 6.80$ ,  $p = .011$ .

In the study tips usage groups, there were several significant differences between the participants who opened the study tips attachments and those who did not. First, with regard to study time, there was a significant interaction effect,  $F(1,25) = 8.04$ ,  $p = .009$ , such that those who opened the study times increased while those who did not open them decreased in time spend studying.

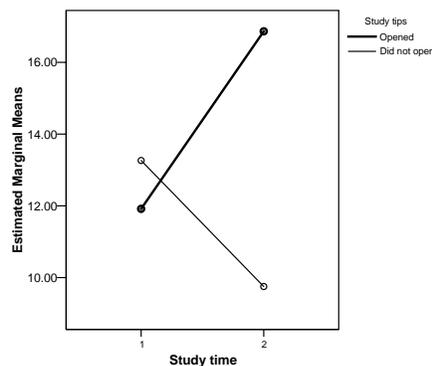


Figure 1 Study time differences between study tip groups

There were no differences between the two groups in interest or relevance, but there was a difference in confidence. There was a significant interaction,  $F(1,38)= 3.43, p=.072$ . Those who opened the study tips scored lower on the pre-measure than those who did not open them, but their confidence increased slightly on the post-measure while the scores of those who did not open the study tips decreased dramatically (Figure 2).

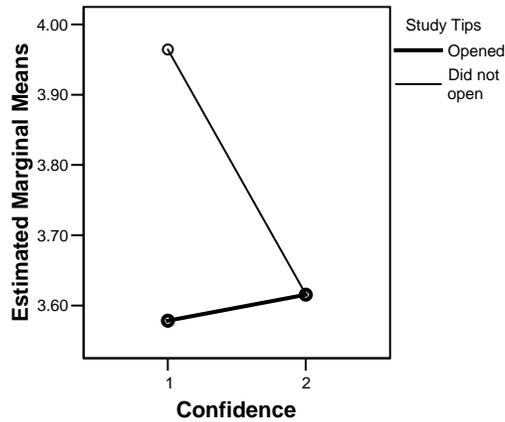


Figure 2 Confidence differences between study tip groups

There was also a significant difference in test scores,  $F(1,38)= 9.00, p=.005$ , in that both groups scored higher on Test 2 than Test 1. The interaction was not significant even though the magnitude of improvement in the “opened study tips” group was greater than the “did not open” group (Figure 3).

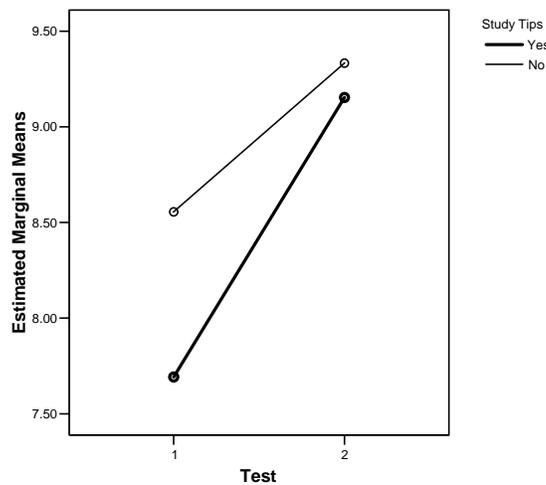


Figure 3 Test score differences between study tip groups

### Discussion

Results indicate that the combined set of motivational and volitional strategies contributed to improving students’ study habits, attitudes toward the course, and learning performance. This indication is supported by the results that students in the treatment group who opened the study tips had spent more time studying, had increased confidence, and performed better in the test than students who didn’t open the study tips. Although confidence dropped overall in the three message-type groups, this is probably due to the fact that people were overconfident at first and it was not surprising that the confidence would drop after taking the first test and discovering that their

grades were not as high as they had, perhaps, hoped. According to the instructor, some students choose to take this course for one of their general education requirements because they expect that it will be an easy course, and maybe they think it will be exciting like watching the action adventure movie, "Raiders of the Lost Arc," which has a strong archaeological theme. But, the students find that it is not easy and that it is filled with highly technical detail. The first measure of confidence was taken before the first test when students just started this course and were, apparently, over confident. The second measure was taken right before the second test when confidence would be low due to the students' experience of the first test results. Worthy of mention is those students who chose to open the study tips have maintained and slightly increased their confidence. This further confirmed that the combined set of motivational and volitional strategies can have a positive impact on maintaining students' motivation.

In contrast to the expectations of this research, there were few differences among message-type treatment groups concerning study habits, interest, confidence, relevance, and grades. One reason might be the limited participation—relatively few number of students opened the study tips of containing combined sets of motivational and volitional strategies. The limited participation can be due to several reasons: 1) Students got confused about various emails—email from instructors, other people, etc. 2) Some students won't open the attachment if it's not important or crucial to them. 3) Some students may be afraid of opening the attachment because of bugs or virus. Future research could consider getting more control over the situation—a situation where it is assured that students will receive and examine the sets of study tips. Future research could also improve the implementation of the treatments (sometimes there were time gaps that were too long). Besides, future research should adopt better ways to deliver study tips and messages rather than simply sending them through emails. Even so, the results of this study support the feasibility and effectiveness of incorporating combinations of motivational and volitional messages into packages of information that are distributed in the form of "motivational messages."

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