

Effects of Integrated Motivational and Volitional Tactics on Study Habits, Attitudes, and Performance¹

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Abstract

There are many challenges with respect to learner motivation and persistence in large, undergraduate courses in which most students are taking them to meet general education requirements. Also, there are limitations on the findings of research on learning motivation in these settings because most of the studies are of short duration and deal with isolated variables. The present study incorporated an integrated set of motivational and volitional “study tip” strategies that were implemented over a four week period to one of three groups, the “distributed” group. All of the strategies were delivered at the beginning of the four weeks to a second group, the “bundled” group. A third group, together with both of the message groups received placebo messages to control for potential novelty effects of receiving unexpected emails. The primary finding was that students who opened the study tip emails increased their study time, maintained confidence, and improved their test scores compared to those who did not open them. Thus, it became clear that the study tips were most beneficial for students who displayed volitional deficiencies, i.e. students who were in need of additional study tips, as well as motivational deficiencies. 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

A continuing challenge in undergraduate general education courses is how to stimulate and sustain learner motivation and persistence. Controlled research studies tend not to 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 motivational challenges that occur during a semester-length course or a significant portion of it are much different from a “single sitting” research study in which there is hardly any time to overcome the novelty effects of an intervention before the experiment is finished. Also, in a longer study, learner’s motivational attitudes at the beginning of a course, even if they are positive, cannot be expected to persist over a long period of time unless things are done to help sustain them. One thing that might help accomplish this is to use a combination of motivational and volitional strategies that are presented to the students in a timely manner. Motivational strategies help students develop interest in the course and a positive expectancy for success while volitional strategies help them stay on task and persist until they have accomplished their goals. However, previous research has not tested a process of systematic development and implementation of combinations of motivational and volitional strategies. To provide a means for the rational selection and creation of such sets of strategies, an integrative model of motivational design (Keller, 1987, , 2004) 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. Thus, the purpose of this study was to determine whether a provided set of motivational and volitional strategies in the form of study tips would improve motivation, persistence, and achievement during several weeks of a semester-length course.

The theoretical foundation of this study is based on a modern conception of what is, in fact, one of the foundational concepts of motivation. 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; 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 primary contribution is in explaining how people choose a particular goal or set of goals. Also, it is part of the theoretical foundation of an integrative theory of motivation that provides a basis for systematic motivational analysis and design. Called the ARCS model, which is an acronym for attention, relevance, confidence, and satisfaction, this theory is based on a rational synthesis of motivational concepts and theories and has been validated with respect to its theoretical basis and its effectiveness as a process for motivational design (Keller, 1987, , 2004).

However, motivation theory and research does not always provide an adequate explanation of volition, or that which impels people to action and keeps them working persistently to achieve a goal. Consequently, it is beneficial to make a distinction between "selection motivation" and "realization motivation" (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. These challenges also exist in 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 always 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, related work has been done by Zimmerman (1998b) and Corno (Corno, 2001) who study volitional behaviors in the context of self-regulated learning.

In his theory of action control, which is being used as one of the organizing structures in this study, 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 that 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. 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 (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 benefit for any kind of learning environment but especially 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 (2001) 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. In the present study, these volitional and motivational theories were used systematically to design strategies in the form of study tips for distribution to the participants.

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 with 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 as in the present study. Also, the interventions tend to be presented at the beginning of the treatment (Azevedo & Cromley, 2004), which is normal in short studies of one period, but might be ineffectual in a longer treatment period. To control for this possibility, the present study contained three patterns of distribution. In the first, strategies were distributed to the experimental group at intervals during the treatment period. In the second, the strategies were bundled into one booklet and sent as an email attachment at the beginning of the treatment period. The third condition was 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 have a positive effect on motivational attitudes and on achievement.

Method

Participants

There were 115 students in the undergraduate archaeology class used in this study. Of these, 90 indicated their willingness to participate by filling out a pre-treatment questionnaire of study habits, volitional habits, and course-specific motivational attitudes. Twenty-three of the original participants were eliminated because they failed to return 3 or more of the 10 weekly logbooks. Thus, 77 participants were used in the initial test of the major hypothesis concerning the overall effectiveness of the treatment.

The motivational and volitional strategies that were used in this study were distributed as attachments to emails. In the final questionnaire, participants were asked if they had opened the attachments. Slightly more than half said they did not open them. Therefore, in the three remaining analyses, only those students who opened the attachments and for whom there was complete log book data were included. The exact numbers are indicated in the analysis section.

Research Design

In the first set of analyses, there was one independent variable, message type, with three levels: bundled messages, distributed messages, and placebo messages. 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 1) study habits as measured by study time, 2) three components of motivational attitudes toward the course (interest, relevance, and confidence) as measured by a question based on the appropriate subscales in the Course Interest Survey (Keller & Subhiyah, 1993), and 3) achievement as measured by test grades.

Variables, Measures, and Analysis

The first of the two independent variables in this study, 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. In another group, the 'distributed' group, the messages were sent at intervals based on decisions of the instructor and researchers as to when a given type of motivational and/or volitional support would likely be of most benefit to the students. Finally, a set of placebo messages was prepared and distributed to the control group, the 'placebo' group, together with the bundled and distributed groups during the first three of the four weeks of the treatment. These three messages consisted of historical anecdotes, humor, and unusual facts that might be of interest to the class but were not relevant to the treatment messages or the examinations (Table 1).

 Insert Table 1 about here

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 Cronbach'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. A confidence interval of .05 was adopted for the major research question. For the ad hoc analyses, an interval of .10 was chosen because of the relatively small sample size and the exploratory nature of this study in an action research setting. 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 foci, and brief explanatory comments are contained in Table 1.

Insert Table 2 about here

Procedure

The research team attended the first day of class to administer a survey of study habits, attitudes, and course-specific motivation. Participation was voluntary. If students filled out and returned the questionnaires, it indicated their willingness to participate. 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 course 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.

Results

There were two sets of analyses. With respect to the first independent variable, message type, measures of student motivation, study time, and test scores were taken just prior to the first test and again just prior to the second test. Based on the use of repeated measures analysis, there was a significant decrease in self-reported confidence in getting a high grade, $F(1,76)= 6.80, p=.011$, but there were no differences among groups. Also there were no significant differences among groups with respect to study time, interest, relevance, or test scores.

With respect to the second independent variable, study tips, 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 spent studying.

Insert Figure 1 about here

There were no differences between the two groups in interest or relevance, but there was a significant interaction, $F(1,38)= 3.43$, $p=.072$ in confidence. 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).

Insert Figure 2 about here

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).

Insert Figure 3 about here

Discussion

Results indicated that the combined set of motivational and volitional strategies contributed to improving students’ study habits, attitudes toward the course, and learning performance. This conclusion 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 had a higher increase in test scores than students who didn’t open the study tips. Although confidence dropped overall in the three message-type groups, it

might be because people were overconfident at first and then their confidence dropped after taking the first test and discovering that their grades were not as high as they had 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 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—a relatively small 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 may have been afraid of opening the attachment because of bugs or viruses, and 3) some students would not open the attachment if they did not perceive it as being important or crucial to them. This third reason is the most likely one based on a small number of comments (2 or 3) in student emails indicating that they were very busy and did not want to receive emails that were not directly related to their course requirements. This is consistent with a basic principle in the ARCS model of motivational design which stipulates that one should identify a specific motivational gap before developing and implementing a solution (Keller, 1999). In the present study, there were prior indications that perceived relevance was low, but this was not confirmed. The problem may have been that many of the students were high in extrinsic relevance (wanting to get a good grade), but low in intrinsic relevance (usefulness of the content) and they apparently had no desire to increase their perceptions of intrinsic relevance. A

similar finding was obtained by Means, Jonassen, and Dwyer (1997) when they compared groups that received treatments that would be intrinsically versus extrinsically motivating.

Future research should consider ways of designing the study to have more control over the situation in order to obtain more detailed and precise audience analysis information. This would help ensure that the study tips would be relevant to a given student's needs and increase the likelihood that the students would open the attachments.. However, 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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Table 1 Placebo message descriptions

	Title (Email Subject Line)	Description
1	How old are pants?	<ul style="list-style-type: none"> • How old is the oldest house in the world? • When were pants (as in trousers) invented? <p>The article on this website has some interesting, little known, facts discovered by archaeologists.</p> <p>Click on the following URL [URL followed].</p>
2	Archaeology & the Mafia	<p>Major in archaeology and work for the Mafia.</p> <p>Believe it?</p> <p>Or not?</p> <p>Check it out at: [URL followed]</p>
3	Scythians & Hell's Angels	<p>Hello everyone,</p> <ul style="list-style-type: none"> • How were the ancient Scythians like the Hell's Angels? • How many people did a Scythian woman have to kill in battle before she could get married? • Why are the Scythians mentioned in Ernest Abel's book, "Marihuana, the First 12,000 Years?" • How are the Scythians related to some modern fantasy fiction, such as "Conan the Barbarian?" <p>Click on the following URL [URL followed].</p>

Table 2 Study tip descriptions, focus, and comments

Study Tip Titles	Motivational/Volitional Foci	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	Motivation (building a multidimensional perception of relevance)	This was one of the motivational challenges (gap) within 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.

<p>Making Anxiety Work for You</p>	<p>Motivation and volition (rebuilding or maintaining expectancies, emotion control, motivation control, and environment control)</p>	<p>Building confidence and reducing anxiety caused by fear of failure.</p>
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Figure 1 Study time differences between study tip groups

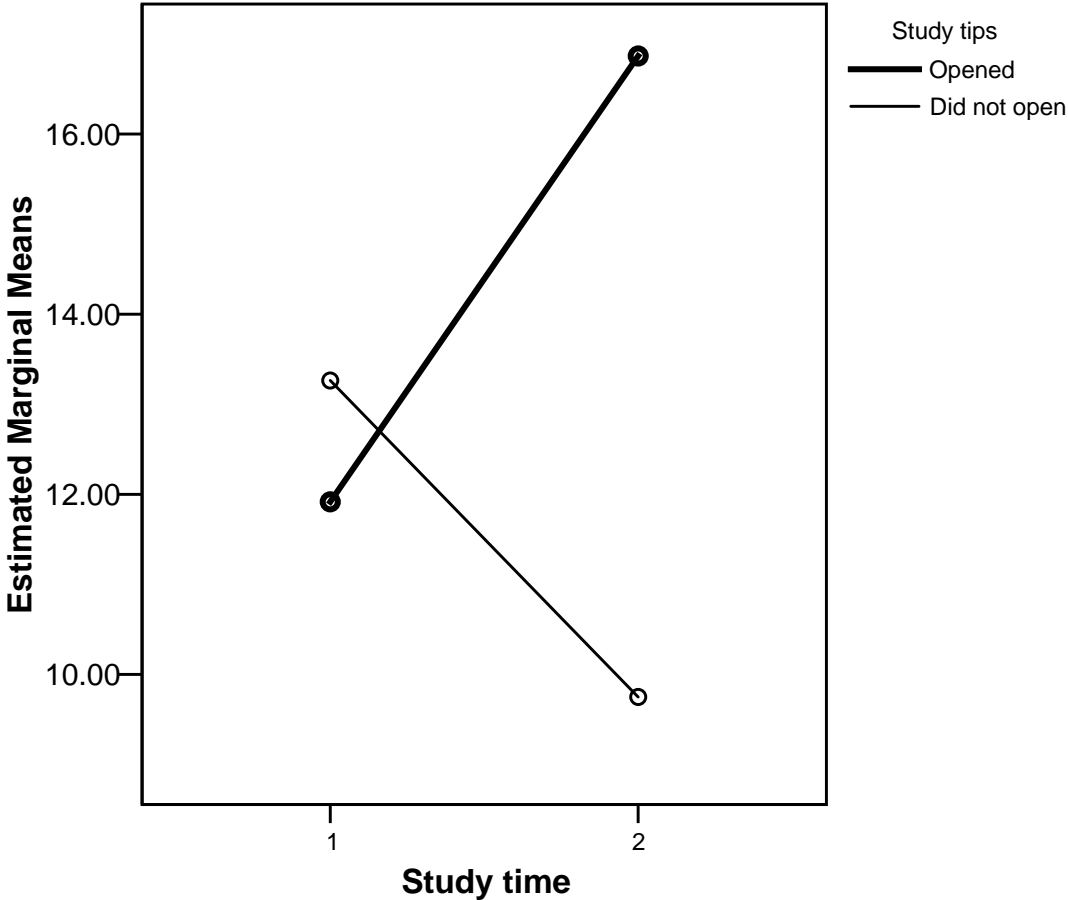


Figure 2 Confidence differences between study tip groups

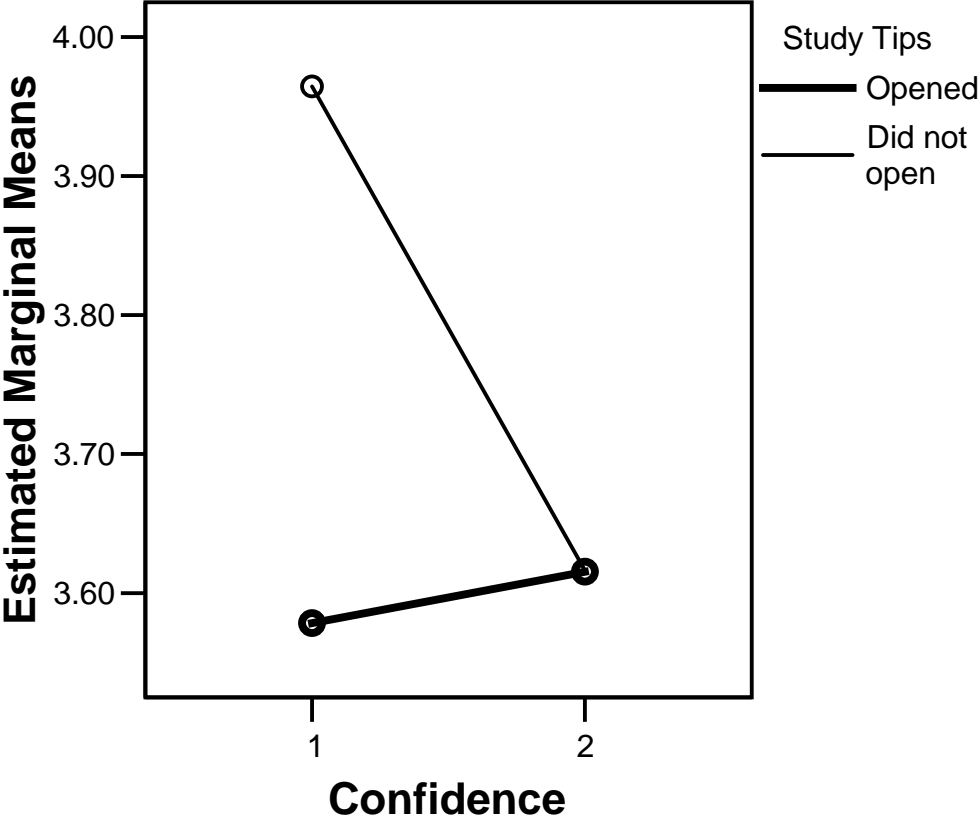


Figure 3 Test score differences between study tip groups

