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Effects of Chat-Based On-Line Cognitive Behavior Therapy on  
Study Related Behavior and Anxiety

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[EXTENDED REPORT]

### Abstract

The aim of this study was to examine effects of chat-based on-line CBT on a university student's study related behavior and anxiety. The study used a single participant multiple baseline design across three self-recorded behaviors consisting of hours of study, number of pages read, and note-taking quality, accompanied by recordings of daily anxiety levels. After baseline, the participant received 6 x 45 min weekly chat-based on-line sessions of CBT. Results show that the three study behaviors increased, and anxiety decreased. These results appear comparable with those of conventional face-to-face CBT for similar problems, suggesting that chat-based on-line CBT may be an alternative for clients with accessibility or anonymity concerns.

*Keywords:* Chat-based Internet treatment, study related anxiety

## Effects of Chat-Based On-Line Cognitive Behavior Therapy on Study Related Behavior and Anxiety

Cognitive behavior therapy (CBT) via the Internet is showing considerable promise. Clients who do not require therapist contact can access effective self-help programs on web-sites (e.g., Klein & Richards, 2001), while those who require regular therapist contact, can now access chat-based on-line arrangements in which therapists and clients exchange written communication in synchronous time. However, appealing as chat-based therapy is, there are few studies of its efficacy.

A notable study was that of Cohen and Kerr (1998) who compared effects of chat-based therapy with face-to-face therapy on anxiety levels of university students. Intervention consisted of a single session of either mode of therapy in which a basic cognitive behavior therapy procedure was applied. Results showed similar decreases in anxiety, measured by the State Trait Anxiety Inventory (STAI) (Spielberger, 1977), across the two modes of delivery. Furthermore, students reported similar ratings of sessional characteristics such as depth, smoothness, and trustworthiness of therapists. However, the study was limited in that the specifics of the anxiety problems were not reported, and the anxiety measures were taken immediately after the single therapy session, with no follow-up observations.

On the other hand, multiple sessions of conventional face-to-face CBT can clearly reduce study related problems (e.g., Hains, 1992; Sanghvi, 1995; Vagg & Papsdorf, 1995), but it remains to be shown whether these results are replicable over the Internet.

The aim of the present study was to examine effects of a more conventional CBT delivered via chat-based Internet on a student's study related behavior and anxiety.

## Method

### *Setting*

On-line CBT sessions took place on a private chat-based Internet site at an Australian metropolitan university. The participant accessed the chat site from her home or university campus. The researcher (the first author), who was a postgraduate clinical psychology student, served as the therapist, and linked with the participant on a university Internet terminal once a week at an agreed time. The therapist was supervised by the coauthor, a clinical psychologist.

### *Participant*

A female first year undergraduate student in social science, 22 years of age, participated in this study. She was single and lived in shared student accommodation on campus. The participant was the first student who responded to a flyer that offered Internet assistance for improving study skills, and met selection requirements including presentation of problematic study behavior, trait anxiety not exceeding moderate levels, and was comfortable and competent in using the Internet.

The selection procedure included completion of questionnaires, which were mailed to the participant, followed by a one hour interview with the researcher. The participant scored 40 on the Stress Vulnerability Questionnaire (Miller & Smith, 1998), indicating low vulnerability to stress; and scored a trait anxiety of 36 on the STAI, indicating normal anxiety characteristics. The Study Habits Inventory (Cook Counseling Center, 2000) revealed that her anxiety was primarily study related. The participant had difficulty

maintaining a regular pattern of study, and had trouble covering the assigned reading. Perusal of the quality of notes she made after reading her assigned texts revealed that there was no recognizable pattern of note-taking that prepared her for examinations. Also, the participant indicated familiarity with computers and the Internet based on her responses to a questionnaire designed by the researcher (available from authors).

### *Measures*

The participant obtained self-recording forms (available from authors) from her on-campus mailbox and returned completed forms before each on-line therapy session. The following were self-recorded.

*Study behaviors.* Daily levels of three study behaviors were recorded, each defined as follows: (a) Hours of study per day, calculated by recording starting and finishing times of study sessions each day; (b) Daily number of pages read (excluding pictures and graphs) during study sessions; and (c) Daily points for note-taking quality, using the Cornell method (see Pauk, 1993). The participant's note-taking was examined and points were assigned for observations that corresponded with the 13 characteristics of the Cornell criteria, including use of subheadings, clarifying questions, and summarizing each page of notes into one or two sentences. A maximum score of 13 was possible. Scores from 1-5 indicated low quality of notes, 6-9 indicated moderate quality, and scores 10-13 indicated high quality of notes.

*Anxiety ratings.* The participant rated her study anxiety after completion of each study session using a scale of 1-10, with 1-3 indicating low anxiety, 4-7 indicating moderate anxiety, and 8-10 indicating high anxiety, and averaged the ratings each day.

Also, STAI trait-anxiety scores were obtained before baseline and at completion of on-line CBT.

*Sessional content.* Transcripts of the on-line sessions were analyzed for verbal content at the completion of observations. The participant's phrases (excluding greetings and farewells) were designated into one of five categories defined as follows:

1. *Extreme workload.* Statements that mentioned impending due dates, attempts at time management, making/having/keeping to a study plan, or organizing life around the study plan. For example, "I have two assignments due next month," or "I've been trying to find time to keep surfing while I study for exams and work."

2. *Distraction from study plan.* Statements that referred to procrastination or distraction from the study plan because of conflicting choices. For example, "I didn't have time to finish reading a chapter last night as I decided to go to a movie with friends," or "I had to spend the weekend helping my sister plan her wedding and could not prepare for the test on Monday," or "I spent the weekend working in the garden instead of studying."

3. *Physical symptoms.* References to bodily tension, headaches, heart palpitations, sleep problems or changes in sleeping patterns or how these may have interfered with study. For example, "I have had difficulty sleeping over the last few weeks," or "By midnight I have developed a headache and have not been able to study anymore."

4. *Performance concerns.* References to workload, concern with own ability to cope with study, concern about grades/achievement, comparing performance with others, mention of others or own expectations. For example, "I wish I could remember what I read. My friend seems to be able to remember things more easily," or "My lecturer will

be disappointed if I fail this course again,” or “I don’t think I am capable of achieving the grade I want.”

5. *External variables.* Mention of relationship problems, family problems, employment or financial problems. For example, “I am trying to reconcile my relationship with my husband,” or “I am struggling to make ends meet while I study, as I have not been able to find work.”

The above categories were derived from using a procedure by Sarantakos (1998). Transcripts were studied and conversational categories across various areas of study anxiety were drafted by the researcher and three other clinical psychology students who were naïve to the purposes of the study. Categories agreed to by all were used to analyze the transcripts.

An independent postgraduate psychology student checked for reliability by categorizing 50% of the transcripts. Of the 40 available statements, 33 were categorized the same way as categorized by the researcher, yielding an interobserver agreement of 82%.

### *Design and Procedure*

Observations over 57 days commenced at the start of the academic semester. A single participant multiple baseline design across study behaviors with changing criterion for two behaviors (Hours of study, and Number of pages read) was used. Procedures were as follows.

*Baseline.* During this phase the participant did not meet with the researcher on the Internet. Instructions for recording the three study behaviors and anxiety were given verbally at the end of the selection interview when it was decided that the participant met

selection criteria. Baseline lasted 14 days, after which the participant and the researcher agreed to target Hours of study for intervention.

*On-line CBT.* Researcher and participant interacted during 6 X 45 min weekly on-line sessions that aimed at advising the participant on the following: (a) how anxiety occurs, and its connection to antecedents, thoughts, and consequences; (b) basics of CBT; (c) how to set study goals and strategies, and self-evaluate behavior; and (d) basic strategies for reducing study-related distractions and anxiety. Six weeks was sufficient time for meeting therapeutic and experimental requirements and for the study to finish before the participant commenced examinations. On-line CBT for Number of pages read did not begin until criteria for Hours of study were met, and similarly Note-taking quality was not targeted until criteria for Number of pages read were met. Session content is outlined below.

Session 1 (Day 15) was an introductory session. The participant was thanked for being on time for the session and inquiries were made into whether she had any problems logging on to the computer network. The participant was informed of the steps that she was to take in case of connection failure, including trying the connection after a 5 to 10 minute period, and if unsuccessful, telephoning the researcher to reschedule appointments. Also, she was informed that the researcher would check her email account every day for any messages she may have left regarding rescheduling or any questions that may arise. The participant was informed that because facial expressions could not be observed it was important that the researcher be informed if something was said that may have made the participant uncomfortable. Finally the participant was encouraged to comment about the session in terms of what she felt comfortable or uncomfortable about.



The first session included (a) obtaining further background information such as the participant's living arrangements, social supports, and history of study problems, (b) an introduction and explanation of how anxiety occurs and the basics of CBT (e.g., relaxation techniques, and monitoring and restructuring negative thinking; see Beck, 1995; Davis, Eshelman & McKay, 1995), and (c) further details about study problems such as frequencies, durations, and situational specifics, which showed irregular study patterns and negative thinking (e.g., "There's too much to do, I'll never get it done," or "What if I missed the point of the assignment?"). The participant agreed that a steady pattern of daily study time would help her cover the required study material and more adequately prepare her for assignments and examinations. It was agreed that study sessions should occur 6 days each week (starting from Day 16) and that a day per week would be set aside for rest and recreation. The agreed duration of daily study periods was half an hour. The participant was instructed to maintain her recordings of the three study behaviors.

For Session 2 (Day 23), the participant's data showed that she had not achieved the criterion set at the previous session. Impediments to achieving the set criterion of half an hour of study per day for six days were identified, and suggestions for increasing study times were made, including turning off TV and radio, closing her room door to prevent distractions, and telling her flat mates to take telephone messages for her while she studied. Connections between last minute work (antecedent), anxious thought patterns (behavior) and anxiety levels (consequence) were discussed. The participant received further advice on automatic thoughts, core beliefs and relaxation techniques, and was

encouraged to apply CBT techniques for the duration of the study. Starting from Day 24 she was encouraged to meet the study criterion set the previous week.

During Session 3 (Day 30), Number of pages read was targeted for intervention. The participant was encouraged to maintain her established pattern for Hours of study while Number of pages read was targeted. Baseline levels for Number of pages read were examined and found to vary similarly to the initial observations of Hours of study. The participant agreed to read at least six pages in the half-hour period she studied starting from Day 31. She was provided with information on how to optimize reading speed and efficiency, and how consistent study behavior would positively affect her problematic thoughts (e.g., problem thoughts such as “I’m unable to meet my lecturers’ expectations” or “I can’t cope with the workload” were expected to decrease or dissipate with time).

In Session 4 (Day 38), the participant reported that she had achieved the set study criteria and wanted to increase her study time and reading. During this session, criteria for Hours of study and Number of pages read were changed to 1½ hours and 12 pages per study session.

During Session 5 (Day 49) the participant stated that because of an influx of assignments she wanted to study everyday without breaks. She wanted to increase her study criteria to 4 hours and read at least 40 pages per day. It appeared that the participant now began to appreciate the benefits of a daily and regular study pattern. However, levels of Note-taking quality showed that note-taking remained deficient. The participant was accordingly advised to use the Cornell method for note-taking, and to structure her notes as close as possible to this method so as to achieve at least 6 points per day for six days. A template for structuring note-taking was provided (available from authors).

During Session 6 (Day 57), the participant's data for the past week were examined, which showed that she had successfully maintained criterion levels for the three study behaviors. The conclusion of the study was discussed and the participant was invited to comment on receiving support and instruction over the Internet.

### Results

Figure 1 shows daily levels of the three targeted study behaviors across baseline and on-line CBT. During baseline, Behaviors 1 (Hours of study) and 2 (Number of pages read) were variable, without trend, at averages of 0.43 hours and 8.5 pages read per day, respectively. Behavior 2 showed a sudden increase on Day 21, the day before an assignment was due, after which behavior decreased to previous levels. Behavior 3 (Points for note-taking quality) showed low variability, no trend, with a daily average of 0.8 points.

During on-line CBT, Behavior 1 was variable at an average of 1.5 hours per day for the period to Day 24, which included the assignment deadline on Day 22. Subsequently, stable study hours were observed at an average of 0.5 hours per day for at least six days, which was the set criterion (criterion levels are indicated by horizontal lines in Figure 1). From Days 39 to 49, Behavior 1 increased to a stable average of 1.5 hours per day (criterion was 1.5 hours for at least 6 days). From Days 50 to 57, behavior increased to an average of 5.2 hours per day, with an initial increasing trend, followed by a decreasing trend (criterion was at least 4 hours per day for six days).

Behavior 2 showed stable increases in levels corresponding with the increasing criteria. From Days 28 to 39, the average was 6.2 pages per day (criterion was 6 pages per day for 6 days). From Days 40 to 49, average was 12.5 pages per day (criterion was

12 pages per day for 6 days). From Days 49 to 57, average was 45.1 pages per day (criterion was at least 40 pages per day for 6 days).

Behavior 3 (Points for note-taking quality) showed a sharp increase to an average of 7.4 points. This met the criterion of at least 6 points per day for six days.

Figure 2 shows average daily anxiety ratings during baseline and on-line CBT. During baseline there was an increasing trend in anxiety ratings from 2 to 7 (average of 5.8). With on-line CBT, anxiety ratings remained at an average of 5.6 until Day 22, followed by ratings decreasing to 1 on Day 26. From Day 26 to Day 35 there was an upward trend to a score of 6, after which ratings settled at an average of 3.9 through to Day 57. Trait-anxiety scores were unchanged at 36 before therapy and at posttherapy, which were within the average range expected for university students.

Table 1 shows the participant's average number of statements per session in each category. By far, extreme workload was the primary verbal content of sessions. Nonstudy related statements were rare.

## Discussion

The results show that chat-based on-line CBT increased a range of positive study behaviors accompanied by a decrease in anxiety to moderate and stable levels. A clear functional relationship between on-line CBT and the three study behaviors was observed, although stable change in Hours of study was delayed, probably related to the first assignment due soon after therapy began. The assignment may have contributed to increases in Hours of study that overly exceeded the set criterion. However, the subsequent two assignments did not appear to have had similar effects on Hours of study, Number of pages read, or anxiety. This suggests that on-line CBT effectively achieved

desired and stable patterns of study behavior that did not necessitate last minute study, nor increase anxiety prior to assignments being due. The efficacy of on-line CBT is also highlighted by the observation that while Hours of study and Number of pages read showed high increases prior to Day 22, Number of pages read returned to baseline levels after Day 22, whereas Hours of study, which was intervened on, remained at criterion levels. Number of pages read did not meet criterion until targeted for intervention.

Content analysis of the sessional transcripts showed that the CBT sessions remained focused on study related matters and that therapy did not stray into other areas, thus lending integrity to the on-line procedure used. Although an average of 5 statements per session on workload matters appears low, it should be noted that the time taken to verbally interact in chat environments is considerably more than that in conventional face-to-face sessions. Generally, fewer interactions are to be expected in on-line chat environments.

Results of the present study extend those of Cohen and Kerr (1998) by showing positive effects on a range of study behaviors, as well as reduced anxiety, over a two month period. Furthermore, the results appear comparable with those of conventional CBT studies of clients with moderate trait anxiety and similar study related problems. Future studies should directly compare interventions similar to that of the present study with more conventional CBT.

Another obvious area for future studies is comparative research with self-help programs containing manuals, telephone contact, or access to web-sites. For example, Burgess and Chalder (2001), in an uncontrolled study, treated participants with chronic fatigue syndrome with cognitive behavior therapy using manuals and fortnightly

telephone counseling for about 10 weeks. Results showed symptoms were alleviated and general health improved, and results maintained at 6 months. It may be that telephones offer less costly, more accessible, and even more synchronous aural interactions for therapy (see Rutter, 1987). Furthermore, therapist contact may be less than critical. Klein and Richards (2001) reported the use of cognitive behavior therapy without therapist contact. They examined effects of a one week self-help program accessed on a university web-site, and reported short-term positive results on panic disorder symptoms. Are chat-based on-line media more cost-effective than web-based or telephonic media? Apparent advantages of chat-based therapy include immediate verbatim print-outs of interactions, quick and easy delivery of written materials such as information sheets, recording forms, and progress reports, but these seeming advantages remain to be demonstrated empirically. Comparative studies in this area are needed to further the viability of chat-based on-line therapy.

Two procedural issues require comment. First, the Internet connection failed several times during sessions, although reconnection took only a few minutes. When these failures occurred, conversation ceased abruptly, which left researcher and participant momentarily jarred and frustrated. These technological failures can be disconcerting and may detrimentally affect therapist-client relations, and given that such problems can never be totally avoided, it would be prudent to prepare clients for such events by, for example, arranging back-up telephone contact if Internet communication cannot be resumed within a reasonable time.

Second, a poststudy debriefing indicated that the participant was not entirely comfortable with using the chat environment because she felt vulnerable to being

misunderstood, although there was no suggestion that this had occurred during the study. This reflects a problem discussed by Sampson (1998) who stated that a literacy barrier would exclude people who were not comfortable or fluent with the written word from benefiting from Internet interactions. Also, Sander (1996) discussed the possible barriers that may arise because of a lack of familiarity with the technology. In the present study, action could have been taken to increase the participant's comfort with on-line written interactions. For example, one or two sessions could have focused exclusively on learning and experiencing Internet conversation.

In conclusion, the present study contributes to the growing area of chat-based on-line therapy. In particular, the findings of the present study together with those of Cohen and Kerr (1998) demonstrate that chat-based environments are an effective medium for treating study related behavior and anxiety, and that results appear comparable with those of conventional face-to-face CBT for similar levels of anxiety. Chat-based on-line CBT, which is becoming increasingly available and less costly, appears a promising alternative for clients seeking assistance, but have difficulties accessing face-to-face therapy, or prefer more anonymous assistance.

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### Author Note

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Table 1

*Average Number of Statements per Content Category per Session*

	Category 1	Category 2	Category 3	Category 4	Category 5
	(Extreme work load)	(Distraction from study plan)	(Physical symptoms)	(Performance concerns)	(External variables)
Frequency	5.0	0.5	0.25	1.25	0.75

## Figure Captions

*Figure 1.* Participant's study behaviors across baseline and on-line CBT. Assignment due dates are indicated by asterisks.

*Figure 2.* Participant's average daily anxiety ratings across baseline and on-line CBT. Arrows indicate when study behaviors 1, 2, and 3 were targeted for intervention. Assignment due dates are indicated by asterisks, and pre- and posttrait anxiety scores are shown below the figure.