# Automatic thoughts, school success, efficiency and satisfaction of university students[#]

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**Abstract:** Student Automatic Thoughts Questionnaire for assessment of University students' typical automatic thoughts during studying and taking an exam has been developed. The scale resulted in 5 interpretable subscales: negative expectations and discouragement regarding exam; negative attitude toward the subject; fear of disappointing parents; lack of motivation; and positive (encouraging) automatic thoughts. Successful and efficient students, as well as students who are satisfied with their achievements, have more positive, and less negative automatic thoughts focused on failure, parents' disappointment and motivation. Automatic thoughts better differentiate students by their satisfaction, than by their success and efficiency. Negative automatic thoughts related to fear of disappointing parents are the best predictor while negative automatic thoughts related to negative attitude toward the subject are the worst predictor of students' satisfaction, success and efficiency.

**Key words:** automatic thoughts, school success, satisfaction, efficiency, students, questionnaires, Croatia

# Samodejne misli, študijski uspeh, učinkovitost in zadovoljstvo pri univerzitetnih študentih

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**Povzetek:** Razvili smo Vprašalnik samodejnih misli študentov za oceno tipičnih samodejnih misli med študijem in v izpitnih situacijah. Vprašalnik je namenjen univerzitetnim študentom. Lestvica vsebuje pet podlestvic: negativna pričakovanja in razočaranje nad izpitom, negativni odnos do predmeta, strah pred tem, da bi razočarali starše, pomanjkanje motivacije in pozitivne (spodbudne) samodejne misli. Uspešni in učinkoviti študentje in študentje, ki so zadovoljni s svojimi dosežki, imajo več pozitivnih in manj negativnih samodejnih razmišljanj, osredotočenih na poraz, razočaranje pri starših in motivacijo. Samodejne misli bolje razlikujejo študente po njihovem zadovoljstvu kot po njihovem uspehu ter učinkovitosti. S pomočjo podlestvice negativnih samodejnih misli, povezanih s strahom pred tem, da

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bi razočarali starše, najbolje napovedujemo zadovoljstvo, uspešnost in učinkovitost, najslabše pa s podlestvico negativnih samodejnih misli, povezanih z negativnim odnosom do predmeta.

In the past 20 years, the learning disabilities field evidenced a significant increase in research activities, both basic and applied (Wong, 1996). Based on numerous research findings it was recognized that students with and without academic failures and learning difficulties differ in one or more basic cognitive functions necessary in processing (Gathercole & Baddeley, 1993; Trapani & Gettinger, 1996). Deficits or dysfunction in information processing (in any phase) is recently recognized as the cause of learning disability in children, adolescent and adults.

Defining the term "learning disabilities", sometime called "specific learning disabilities", Hammill (1993), argues that this is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction.

As a consequence of repeated academic failure or learning problems, learning-disabled students develop specific secondary characteristics. These are poor motivation for long-lasting learning, tendency to give up and withdraw, and lack in interest in acquisition of new learning strategies. The next typical secondary characteristic of learning disabled students is low self-esteem. The comparison of groups of students with and without learning difficulties shows significant difference in self-control regulation between them. Students with academic failure have insufficient self-regulation (one form of metacognition), which means planning and learning in time sequence, persistence in long-lasting learning, effort and time for successful learning, learning from prior experiences how to learn, ability to generalize from one kind of tasks to similar one. They do not have flexibility and strategic learning approach in learning new subjects (Harris, 1986; Trapani & Gettinger, 1996). Besides deficits in self-regulation many students with learning disability have also other characteristics making learning more difficult. These are hopeless behavior, external locus of control, maladaptive attributions, deficits in understanding, low motivation, negative affect towards tasks, poor problem solving skills, low efficacy, impulsivity etc. (Wong, Harris & Graham, 1991). There is some evidence that learning disabled students may have proper learning strategies but they do not use them (Shapiro, 1989). Trapani and Gettinger (1996) state that learning disabled students

differ from students without learning disability in cognitive process, cognitive strategies and quality and quantity of private speech.

Cognitive model for understanding and treating dysfunction and maladaptive behavior presumes that cognitive functions (perception, memory, thoughts, believes, attitudes and inferences) have mediating role in interaction between an individual and his changing surrounding (Beck, 1976). Several research support clinical observations that negative automatic thoughts strongly influenced human behavior and affects (Dobson, 1988). Automatic negative thoughts are short, quick, like short flash. They are usually frightening or upsetting and may appear in verbal form, e.g. ("I'll fail again") or as an image e.g. (the face of a strict teacher) . At the moment of their appearance, negative automatic thoughts make the student feel anxious, less concentrated on learning and in lower mood. If repeated continuously, they can severely disturb student's learning process on the cognitive and affective level.

According to the cognitive behavioral model for understanding learning disabilities, and based on our practice in students counseling centers, it seems that negative automatic thoughts are one of the key stones in treatment programs. Cognitive techniques for identification and modification of negative automatic thoughts can significantly decrease emotional tension and test anxiety (Cohn, 1998). At the same time these techniques can improve concentration and learning efficacy. On the one hand, teaching students in using positive, encouraging thoughts (by self-instructional training) increase their motivation and persistence in long-lasting learning. During assessment of learning difficulties special attention must be paid to the identification of the cognitions – students' thoughts, believes and attitudes about their problems and about their own capacities to cope with them.

The purpose of this study was to develop the scale for assessing students' automatic thoughts during learning and taking an exam. Such a scale could provide better understanding of the structure of dysfunctional, as well as encouraging automatic thoughts at university students. That would give us better ideas for developing more precise strategies for treatment, and provide the instrument for evaluation of cognitive techniques used in modification of their negative automatic thoughts.

The study wanted to answer the following questions:

1. What are the factor structure and the reliability of the newly developed Student Automatic Thoughts Questionnaire?
2. What type of automatic thoughts can differentiate students by their success and efficiency when taking an exam, and their satisfaction with themselves?
3. What type of automatic thoughts can best explain the variance of students' success, efficiency and satisfaction?

## Method

### Participants

The sample consisted of 279 students (133 males and 146 females) from different faculties at the universities in Rijeka and Zagreb (age range 19-26 years, $M = 21.19$; $SD = 2.00$).

### Instruments

The newly developed Student Automatic Thoughts Questionnaire has been used (Živčić-Bećirević & Anić, 1999). SATQ has been developed in Croatian language with the aim to assess the negative and positive automatic thoughts that students have during learning and taking an exam and is based on the cognitive-behavioral model of learning difficulties.

### Procedure

The data were obtained during summer and autumn exam period (in June and September 1999) at different faculties and student dormitories at the University in Rijeka and Zagreb.

## Results

Principal axis factor analysis with Varimax rotation has been conducted on all 43 items. There were 5 factors excluded with eigen values over 1. The repeated factor analysis with Varimax rotation on 33 items resulted with 5 interpretable factor that all together explain 52 % of variance. The item analysis has been done for each of five factor subscales. The items that were spoiling the clear factor structure or the reliability had been excluded. Table 1. shows the number of items, means, standard deviations and internal consistency (Cronbach $\alpha$) for each subscale.

The dominant factor of SATQ is the subscale "fear of failure", which has the

*Table 1: The characteristics of Student Automatic Thoughts Questionnaire*

| subscale | No. of items | *M* | *SD* | $\alpha$ |
|---|---|---|---|---|
| FAILURE | 8 | 9.11 | 4.99 | .90 |
| POSITIVE THOUGHTS | 11 | 19.48 | 5.28 | .79 |
| SUBJECT | 5 | 5.48 | 3.09 | .75 |
| PARENTS | 3 | 2.58 | 2.32 | .77 |
| MOTIVATION | 5 | 7.55 | 2.90 | .69 |

highest reliability, while the subscale "fear of dissapointing parents" is very short (just 3 items), so that it's moderate internal consistency has even less informational strength.

To determine what type of automatic thoughts can differentiate students by their success and efficiency on the exam, and their satisfaction with themselves, several analysis of variance have been conducted. Students were treated as successful if their mean grade on previous exams equals or exceeds 4.0, and as unsuccessful if their mean grade is equal or below 3.0. Students were treated as efficient if they mostly pass the exams from the first trial, and as inefficient if they fail the same exam several times. Students estimated their satisfaction on the scale from 1 to 4, and then the two subgroups with extreme estimations were compared. The results of the analysis of variance are shown in Tables 2, 3 and 4, and Figure 1, 2 and 3. To enable the comparison of the results on specific subscales with different number of items, the results on the Student Automatic Thoughts Questionnaire shown on the graphs were transformed in *z*-values.

*Table 2: Automatic thoughts and student success (differences between the two groups, which were statistically important are boldfaced)*

| subscale | successful $N = 145$ | unsuccesful $N = 80$ | F | p |
|----------|--------------|-------------|------|------|
| FAILURE | 9.43 | 8.73 | .982 | .323 |
| **POSITIVE THOUGHTS** | 18.37 | 20.70 | 10.746 | **.001** |
| SUBJECT | 5.55 | 5.33 | .263 | .609 |
| **PARENTS** | 3.19 | 1.51 | 29.440 | **.000** |
| **MOTIVATION** | 7.92 | 6.95 | 5.933 | **.016** |

*Table 3: Automatic thoughts and student efficiency (differences between the two groups, which were statistically important are boldfaced)*

| subscale | efficient $N = 149$ | inefficient $N = 68$ | F | p |
|----------|-----------|-------------|------|------|
| **FAILURE** | 8.28 | 11.01 | 13.249 | **.000** |
| **POSITIVE THOUGHTS** | 20.40 | 17.81 | 12.073 | **.001** |
| SUBJECT | 5.29 | 6.12 | 3.366 | .068 |
| **PARENTS** | 1.73 | 4.00 | 52.008 | **.000** |
| **MOTIVATION** | 6.94 | 8.79 | 19.207 | **.000** |

*Table 4: Automatic thoughts and student satisfaction (differences between the two groups, which were statistically important are boldfaced)*

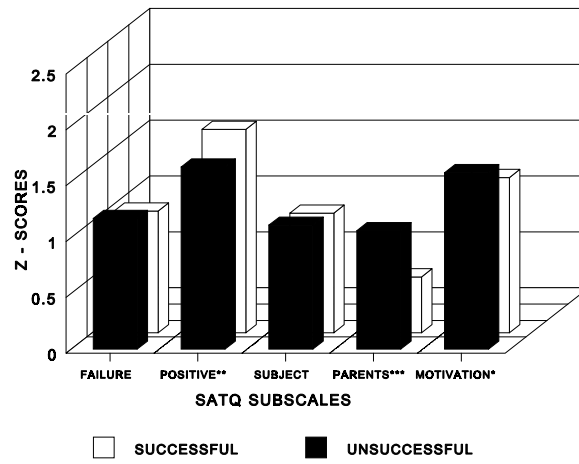| subscale | satisfied N = 79 | unsatisfied N = 27 | F | p |
|---|---|---|---|---|
| **FAILURE** | 8.60 | 13.88 | 30.100 | **.000** |
| **POSITIVE THOUGHTS** | 19.94 | 14.89 | 24.335 | **.000** |
| **SUBJECT** | 5.20 | 8.22 | 25.369 | **.000** |
| **PARENTS** | 2.34 | 4.85 | 31.723 | **.000** |
| **MOTIVATION** | 7.24 | 10.52 | 34.977 | **.000** |



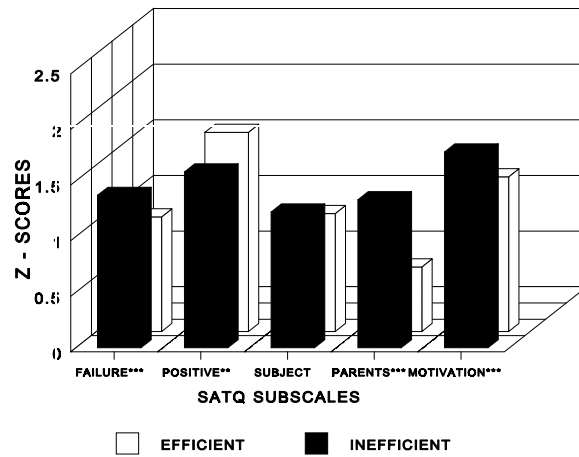*Figure 1: Automatic Thoughts & Success*



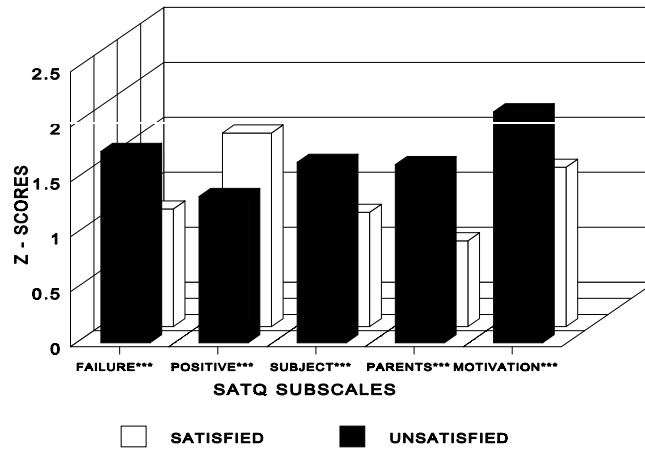*Figure 2: Automatic Thoughts & Efficiency*

*Figure 3: Automatic Thoughts & Satisfaction*

To determine what type of automatic thoughts can best explain the variance of students' success, efficiency and satisfaction the multiple stepwise regression analysis have been conducted. The results on each subscale on the Student Automatic Thoughts Questionnaire were treated as predictors, and the student estimation of their satisfaction and efficiency, as well as their success (mean grade) as criteria. Tables 5, 6 and 7 show the results of the regression analysis only for those predictors that were statistically significant.

*Table 5: Significant predictors of student success*

| **Predictors** | *Beta* | *p* |
|---|---|---|
| PARENTS | -.287 | < .001 |
| POSITIVE THOUGHTS | .150 | .011 |

*Table 6: Significant predictors of student efficiency*

| **Predictors** | *Beta* | *p* |
|---|---|---|
| PARENTS | .415 | < .001 |
| POSITIVE THOUGHTS | .392 | < .001 |
| MOTIVATION | .125 | .032 |

*Table 7: Significant predictors of student satisfaction*

| **Predictors** | *Beta* | *p* |
|---|---|---|
| PARENTS | .432 | < .001 |
| POSITIVE THOUGHTS | -.266 | < .001 |
| MOTIVATION | .222 | < .001 |

## Discussion

The factor structure indicates five types of students' automatic thoughts during learning. The first group relates to negative thoughts about failure expectation. They are significantly more often present at inefficient than at efficient students. It is interesting that thoughts focused on expectation and fear of failure are not related to real student success, defined by mean grade achieved on previous exams. It is clear that high negative expectations can significantly increase anxiety and lower student concentration. In that way, they could cause that the student is unable to pass the exam that would increase his dissatisfaction. On the other side, if the student is not so much disturbed on the exam, his negative thinking about possible failure would not influence the exact grade that is under stronger influence of his actual knowledge. Kamann (1989) also indicates the importance of negative expectation about success in children. His results showed that application of cognitive-behavioral coping strategies with children who are highly anxious about mathematics could significantly improve their mathematics test performance.

The second group includes positive thoughts that students use to encourage themselves during learning and preparation for the exam. These thoughts can best differentiate the students, based on their satisfaction, but also on their actual success and efficiency. These results support the application of self-instructional techniques (positive self-talk) to teach students in using encouraging, but realistic thoughts. Some students try to use "positive" thoughts by themselves, saying sentences that sound encouraging, but are unrealistic and, because of that, highly inefficient. Such thoughts can even increase anxiety, because the student is soon faced with uncertainty about their realization. The examples of such thoughts are "I will surely pass", "It doesn't matter if I fail" etc. Clinical experience confirms the importance of using positive self-talk when working on a specific task, as well as in coping with anxiety in different stress situations. But, such thoughts could be efficient only if they are realistic and if the person fully believes in them. While some people spontaneously produce and use such thoughts, some need specialized training in their application (Kamann, 1989; Meichenbaum & Butler, 1980; Meichenbaum & Turk, 1976; Miller & Brewster, 1992). Harris (1986) investigated the natural occurrence of regulatory private speech among normally achieving and learning disabled students during problem solving. Her results indicated that learning disabled students produced a significantly lower proportion of task-relevant private speech (and significantly higher proportions of task-irrelevant private speech). A self-instructional problem-solving intervention, using a peer model, resulted in significant and meaningful improvements on all measures among both the students with learning disabilities and their normally achieving peers. But it is important that the performance of the children with learning disability after intervention equaled or exceeded that of their competent normally achieving peers in the no-treatment condition. Keogh, Whitman and Maxwell (1988)

found that self-instructional training improved mathematics skills in learning disabled students better than external didactic teaching. Graham and Wong (1993) came to similar results. They found that self-instructional training could improve reading skills and text comprehension better than didactic teaching of strategies.

The third group includes negative thoughts related to the subject student is learning. These thoughts do not seem to be so relevant for the student success in studying and taking the exam. They differentiate the students based only on their satisfaction, but not on their actual success and efficiency on the exams. They are not significant predictors in any regression analysis. Based on these results, it could be concluded that the negative attitude toward and lack of interest for the subject could negatively influence student satisfaction and consequently contribute to decrease of the motivation, which is supported by significant correlation between the results on these two subscales ($r_{subject/motivation} = 0.51$, $p < .001$). In the same time, this negative attitude does not influence the actual achievement on the exam.

The thoughts related to the fear of disappointing parents formed the fourth factor in the Students Automatic Thoughts Questionnaire. These thoughts best differentiate students, based on their success, efficiency and satisfaction. They are also the best predictors for all three criteria of student success (efficiency, mean grade and subjective satisfaction). It is clear that these are the thoughts that distract students' concentration during studying, disturb the process of retrieval and answering on the exam. Clinical experience also prove that many students coming to student counseling centers are saying that they worry about parents' reactions on their realized or eventual failure. Some of them say that they might disappoint parents, that they won't fulfill their high expectation, that they might lose parents' trust and support (emotional and financial), that they will provoke their anger, or that "the parents will turn against them". Each of these negative expectations raise negative emotions and anticipation of very unpleasant immediate, as well as longitudinal, consequences for their personal life and relations with parents. Some of these expectations are surely realistic, but we can also notice that many of them are at least partly distorted and exaggerated, and that they represent a way of catastrofizing consequences. It is necessary to intervene against these distortions (using cognitive restructuring) in therapeutic work with the students.

The fifth group includes the thoughts related to students' lack of motivation for studying and their intention to give up of the exam. These thoughts can well differentiate students based on all three criteria and they are significant predictors of students' satisfaction and their efficiency, but not their success (defined by mean grade on previous exams). Even if this is relatively short subscale with the lowest reliability, it seems that this kind of thoughts play relatively significant role in students' life. These results can be pretty easy understood and interpreted. The students who are less interested and motivated for the college and for studying will normally be less satisfied with their work. The tendency for giving up of the exam and of the

study will more influence on their efficiency in taking exams than on their grades that are supposed to be better measure of their knowledge.

It could be concluded that automatic thoughts generally play a significant role in the process of studying and taking an exam. Automatic thoughts can better differentiate students based on their satisfaction with themselves than on their actual efficiency and real success. Particularly disturbing are the thoughts indicating fear of disappointing parents, while the thoughts focused on the negative attitude toward the subject and negative thoughts indicating fear of failure are less relevant for student success. The significant role of positive, encouraging thoughts in satisfaction, as well as in the efficiency and student success, is especially interesting. Based on the only significant, and negative correlation between the results on the subscale "Positive thoughts" and the subscale "Fear of disappointing parents" ($r = -.143$, $p = .017$), it is reasonable to suppose that training in using encouraging thoughts could reduce the fear of disappointing parents that shows the most destructive influence on the process of studying and taking the exam.

With this research we support the current view that difficulties in academic learning are in great deal influenced by internal mediating cognitive processes, such as believes, attributions and thoughts. Even students with high basic abilities, good working habits and learning skills could fail because of negative self-evaluations, negative attitudes, believes and expectations.

We plan to focus further research on specific cognitions that increase students' anxiety and depression during studying and taking exams, as well as on their strategies to cope with failure. Besides, we will use the Student Automatic Thoughts Questionnaire to evaluate our therapeutic work with unsuccessful students.

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