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# Instrument Development to Assess University Students' Coping with Negative Academic Feedback

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**Abstract.** The students of higher education should perform well enough in academic life. One major problem of academic life is the stress experienced by having high grades. The student who receives a lower grade must cope with this feedback on his performance. Therefore, this study aims at developing an instrument for assessing university students' coping with negative academic feedback. This scale development research is a mixed-method study that is particularly exploratory sequential pattern. The study group consists of 450 university students. In the conclusion of the analyses, it has been determined that the scale consists of four factors. There were nine items in the first factor, six in the second, five in the third, and seven in the fourth. The scale totally has 27 items. The total Alpha coefficient value of the scale is 0.883. Item-total correlation for the scale is between 0.273 – 0.645. The findings have shown that the factor values are between 0.348 – 0.809. The total variance of the scale has been % 49.471. It is concluded that Coping with Negative Academic Feedback Scale (CNAFS) is a valid and reliable instrument for university students.

**Keywords:** negative academic outcome, coping skills, scale development, validity and reliability, university students.

## 1. Introduction

Human beings face negative situations in every stage of education life, like their daily life. The major academic problem a person faces in his education life is negative academic feedback. A student who has begun elementary school should cope with negative academic situations. After that period, with the problems concerning adolescence and then university life, a period characterized by the transition to adulthood, the person evaluates life from a different perspective. In the beginning period of university life, the negative situations a student's faces and how he copes with the situation affect his decision to continue university or not. For this reason, it is critical to assess the student's ability to cope with negative academic feedback because this feedback may affect his decision on education life.

### 1.1. Problem Statement

It is essential to comprehend the first year of higher education, in particular, to ensure that students have continuity (Krause & Coates, 2008). Therefore, the higher education system must be aware of the risks that may take the students to leave the system and lead to dropouts. There may be many risks that can take a student out of the system; personal causes, familial causes, economical situations, etc. Among these various causes, facing and struggling with negative academic feedback are rarely indicated. The relationship of new higher education students with the concept of "success" is one of the most crucial aspects for them to adapt.

Struggling with negative academic feedback seems to be a personal continuum within a student must confront the feedback, accept, and live the emotions related with the feedback.

A student must continue studying with the lessons learned in this process. This period seems to have consisted of coping trials. However, information concerning this process is dispersed throughout the literature. After receiving unfavorable academic feedback, the coping strategy should include academic and psychological aspects. This study aims at developing an instrument for measuring the ability of university students to cope with negative academic feedback. In addition, this instrument development process can contribute to the discussion about which elements make up this coping process. The major aspects that should be expressed are the students' stress; the self-efficacy that may display a vital role for coping, and the emotions felt after the negative academic feedback.

### 1.2. Related Research

Being disciplined by evaluations leads to alienation (Chipchase et al., 2017). Also, there is an assertion that higher education hurts some students and makes them doubt themselves (Bengtsen & Barnett, 2017). Like the other fields of education, students in higher education face the stress of achieving high grades, the fear of having negative feedback, and repetitive negative thinking. Having positive feedback from the educator instructor can bolster self-efficacy and the belief for success.

Self-efficacy is about evaluation of a student's self-control in coping with uncertain and typically stressful situations. This perception of the student about self- efficacy affects how much he persists against the difficulties (Bandura, 1982; Bandura & Schunk, 1981). Self-efficacy is the structure on which the success of the student is construed. The student must have a belief in the ability to succeed. Otherwise, he will have insufficient motives to continue working (Tinto, 2017). For this reason, it is essential to focus on the psychological processes that support the student to work again.

The justification of the students for the failure affects their emotional reactions and the consistency of the work they put in (Diener & Dweck, 1978). In some circumstances, the perception that the academic setting is dull and colorless may demotivate the student. The students' emotions are equally as effective as the cognitions of the learning process (Govaerts & Grégoire, 2008). Emotions get involved in the classroom experienced by the central roles they play in cognitive processing and student participation (Linnenbrink-Garcia & Pekrun, 2011). For instance, being bored is positively related to attention problems while negatively to inner motivation, effort, self-regulation and further academic performance (Pekrun et al., 2010). For this reason, being bored as an emotion directly affects cognition and behaviors.

When the students face intense or frequent problems, these problems may lead to withdrawal from the instruction (Skinner & Pitzer, 2012), lack motivation and keeve the university (Behr et al., 2020). For these serious potential consequences, it is worth examining the evaluation of the students about failing in an academic situation. How does the student comprehend and make sense of success; how do they decide whether they are successful or failed? Depending on that evaluation, how do they feel after that perception? These factors implicate the importance of emotions in and academic setting. Academic emotions significantly affect cognitions, motivation and success (Acee et al., 2010). The examination of these emotions is critical for the students' academic future.

The students face obstacles and failures inevitably. The key is that they must learn how to cope with stress brought on by the failure. It is suggested that being able to cope with school failure is a necessary condition for academic success. It is also emphasized that coping is a process that may change in time (Rijavec & Brdar, 2002). However, every coping attempt may not be effective. Furthermore, some strategies may boost negativity (Chan, 1998). For instance, some strategies like studying late and increasing insomnia may cause a common health problem (Jiang et al., 2015). Consequently, some reactions are nonadaptive (Lewis & Frydenberg, 2002). For this reason, the individual's response in a stressful condition may eventually be adaptive, ineffective or worsening.

Emotions augment the tendency to use different learning strategies. These can be flexible and simple repetition strategies (Pekrun et al., 2011). Controlling one's emotions is essential for coping with negative emotions during learning (Asikainen et al., 2018). Nonetheless, every

emotion may not be accepted in every situation. For instance, when German and Chinese students' academic emotions were compared, it was found that German students felt "anger" more frequently than Chinese students (Frenzel et al., 2007). In light of this finding, it is crucial to note that while anger is suppressed in collective cultures, it is accepted in individualistic cultures (Grimm et al., 1999). For this reason, it is likely that encountering a negative feedback of an academic experience, realizing the emotions felt and finally choosing the adaptive coping reactance is a chain process affected by culture.

The literature is reviewed, and based on self-efficacy, boredom, feelings and cognitions about student commitment with courses taken in university, there is no emphasis on coping with negative academic feedback. However, the sufficiency of coping with negative feedback is vital for a university student who is concurrently in a struggle to maintain his economic resources, taking responsibility to do the housework (cooking, making his dressing ready) and trying to be an adult emotionally, cognitively and socially. The students who have not the coping ability enough to continue taking the course despite negative feedback(s) may be at risk of leaving the university. For this reason, coping with a negative feedback is a significant variable for assessing, before student(s) give up their courses. In this way, the students who are at risk of giving up can meet with the appropriate psycho-social interventions to support them in learning to cope.

### 1.3. Research Objectives

Connected with these notes, this study aims at developing a measurement tool for university students to assess the level of coping with negative academic feedback in Turkish culture. The main research objective of this study is to develop an instrument for assessing the ability of university students to cope with negative academic feedback.

## 2. Theoretical Framework

As mentioned in the section above, this study aims at developing an instrument for assessing the coping of university students' negative academic outcome. This aim is in accordance with a practical and daily/casual problem of a group of people: University students. University students are a group of people who are in a critical junction of their whole life. This junction is the point where childhood ends and where adulthood begins. This is an "in-between" point called by Arnett (1998) as emerging adulthood, which is a developmental period where a person wants to be independent but cannot be total. A person must overcome several challenges when they transition into maturity, including psychological, social, and financial challenges. In this period of life, the person must be successful enough in the courses of the university for getting ready for his work life. This can be a very stressful process, changing in terms of personal qualities of the person and the qualities of the department he continues. The person must overcome many challenges to cope with this stress, face potential negative academic feedback, and continue studying. In the literature, education literature focuses on the instruction part, and psychological literature focuses on the within-person processes. Therefore, it is possible to learn about their coping process by asking them. By asking the students what they think, feel, and do when they face a poor academic result, the researchers want to identify and understand the coping process. For this goal, the students are asked these questions. In summary, it is aimed that there can be a contribution to the theoretical framework about coping literature, specific to the university students' negative academic outcome experiences.

## 3. Method

### 3.1. Research Design

This study aims at developing a tool for assessing the level of coping with negative academic feedback that is specific to university students. The method is a mixed method consisting of both qualitative and quantitative methods. The design of the research is exploratory sequential design. The first step is gathering and analyzing the qualitative data. The quantitative step is realized by analyzing the explored data (Doyle et al., 2016). In this step, interviews are realized,

transcript of records are analyzed, then the item pool is prepared. After that step, pilot applications are realized. Finally the gathered data are analyzed by quantitative method. This instrument is developed by the researchers.

### 3.2. Participant/Respondent

The sampling method used in the study and the sample is given in Table 1.

**Table 1.** The Samples Determined for Developing Coping With Negative Academic Feedback Scale for University Students (CNAFS)

| Data gathering tool | Sampling Method | Sample (N) |
|---|---|---|
| Transcription of interviews with volunteer participants | Convenience Sampling | 14 |
| Pre-implementation (For comprehensibility of the items) | Convenience Sampling | 20 |
| Pilot implementation (item analyses) | Convenience Sampling | 450 |

As presented in Table 1, for identifying the categories of coping with negative academic feedback, volunteer students of a university in Turkey (N=14) were invited to express their feelings, thoughts, and behaviors when they got negative academic feedback. The interviews were recorded for transcription with the permission of the participants. The transcripts were examined and categorized to cope with negative academic feedback. The item pool was prepared in accordance with the categories. Afterwards, a professional's opinion was asked, and the final measure was arranged. Different volunteers (N=20) were given this final version to evaluate the items' readability. The necessary readjustments were performed when the volunteer group provided comments. 450 volunteers from various faculties participated in the pilot implementation at a university in Turkey.

To develop the instrument for assessing university students' coping with negative academic feedback, 450 university students (297 females, 153 males) participated. The participation was provided by various faculties of a university in Turkey. The sampling method used was convenience sampling.

### 3.3. Data Collection

The instrument developed for assessing university students' coping with negative academic feedback is the Likert type. The reactions that can be given to the items of the instrument scales are on five points, from "not appropriate for me" to "completely appropriate for me." The instrument, with all sub-dimensions, rates the individual on how he copes with negative academic feedback.

### 3.4. Data Analysis

The process for accessing the qualitative data is summarized in Table 2.

**Table 2.** The Qualitative Process and Outputs Employed on Developing the Instrument for Assessing Coping with Negative Academic Feedback for University Students

| | Qualitative Data Gathering | Qualitative Data Analysis | Developing The Instrument |
|---|---|---|---|
| Processes | Convenience Sampling | Coding<br>Constitution of categories | Taking the four categories as the sub-dimensions of the instrument<br>Constitution of the item pool<br>Control of the comprehensibility of the items |
| Outputs | Interview Transcriptions | Coded transcription<br>Four sub-dimensions related to coping with negative academic feedback | Pilot implementation form consisting of 48 items |

Interviews were carried out individually or in small groups before constituting the item pool. For examining the participants' opinions and feelings, permission was requested from each volunteer participant to record the interview audial. The participants were polled about their thoughts, feelings, and behaviors when they faced negative academic feedback. The interviews were constructed as semi-structured, so additional questions were directed according to the answers taken from the participant. Key concepts were determined according to the mentioned expressions and the literature.

The process for accessing the quantitative data is summarized in Table 3.

**Table 3.** The Quantitative Process and Outputs Employed on Developing the Instrument for Assessing Coping Negative Academic Feedback for University Students.

| | Quantitative Data Gathering | Quantitative Data Analysis | Interpretation |
|---|---|---|---|
| Processes | Pilot implementation of the instrument | Exploratory factor analysis<br>Item analysis<br>Reliability of the instrument<br>Confirmatory factor analysis | Interpretation of the items assigned to the factors<br>Determination of the confirmatory levels of the qualitative data |
| Outputs | Quantitative Scores | Factor loadings<br>Item-total correlations<br>Cronbach Alpha | Identification of the dimensions<br>An instrument fulfilling the validity and reliability criterions for assessing the coping levels of university students when they face negative academic feedback |

First, the item pool that consisted of 48 items was constituted. The rating of the items of the instrument was organized on a five-grade Likert scale. The high scores of each subdimension

mean that the individual's coping approach to that subdimension is high. The items were presented for expert opinion, and according to the opinions taken, pre-implementation was realized with 20 participants. According to the pre-implementation, the items that were not comprehensible were determined and corrected.

The instrument was implemented with 450 students of various faculties and various classes of a university in Turkey. Exploratory factor analysis, confirmatory factory analysis, and item analyses were carried out with the data.

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity values were examined for the appropriateness of items for exploratory factor analysis. Also, the discrimination level of the items was determined by the item average points for 27% of top and bottom groups. For each sub-scale, the difference between the top-bottom groups was analyzed by independent samples t-test. Confirmatory factor analysis was employed to evaluate the instrument's validity, while the Cronbach Alpha coefficient was employed to assess the instrument reliability.

The constitution of the item pool began by reviewing the literature. There were findings about the importance of emotions in academic life (Acee et al., 2010; Burić & Sorić, 2012); and the importance of self-regulation (Asikainen et al., 2018) in the literature. However, it is now unable to find an assessment instrument to cope with negative academic feedback. For this reason, in the qualitative step of the research, exploratory sequential design was set with a semi-structured interview. In the first step of the semi-structured design, the volunteers were directed to the questions below. Then, if necessary, the volunteers were asked additional questions, too.

**Table 4.** The Open-Ended Questions Directed to the Participants

| | Questions |
|---|---|
| 1 | What do you feel when you encounter a negative academic feedback? |
| 2 | What do you think when you encounter a negative academic feedback? |
| 3 | What do you do for coping when you encounter a negative academic feedback? |

Key concepts were constituted according to the answers linked to the directed questions. The item writing process began with these concepts, and the item pool was set consisting of 48 items.

### 3.5. Validity and Reliability

As mentioned in the section above, the data was collected from university students and volunteers who volunteered to share their feelings and opinions. The thoughts and feelings they expressed are transcribed and when the item pool is originated, the original expressions they prefer are used. Another set of individuals that evaluated and improved the items at this stage previously came up with the idea for the item pool. Therefore, in the stages mentioned in Table 2 and Table 3, it is shown that the validity and reliability of the data is ensured.

## 4. Findings

Likert-type scales generally quantify a structure that is multi-dimensional. To determine how many subdimensions there are, exploratory factor analysis (EFA) is realized. The two aims of EFA are reducing the variables and creating new structures taking advantage of the relations between the variables (Stapleton, 1997). For this reason, EFA was realized to reveal the factor design of the instrument.

Before conducting the EFA, Kaiser-Meyer-Olkin (KMO) test was implemented to test the appropriateness of the sample to factorize. KMO value was 0.88, which was above .60. This result was good (Worthington & Whittaker, 2006). For this reason, KMO value was evaluated as adequate. When Bartlett sphericity test values were examined, it was seen that the chi-square value was significant ($\chi^2_{(351)}$=4807.216; p<.01) and accepted. In other words, the data was normally distributed in multivariate planes. In the EFA process, after removing the items, the

KMO value was changed to 0.85. The KMO and Bartlett test values of the first and last analyses are presented in Table 5.

**Table 5.** The KMO and Bartlett Test Values of the First and Last Analyses

| First Analysis Values | | | Last Analysis Values | | |
|---|---|---|---|---|---|
| The Kaiser–Meyer–Olkin value | | 0.881 | The Kaiser–Meyer–Olkin value | | 0.854 |
| Barlett Test | Approx. Chi-Sguare | 9055.573 | Barlett Test | Approx. Chi-Sguare | 4807.216 |
| | Df | 1128 | | Df | 351 |
| | Sig. | 0.000 | | Sig. | 0.000 |

After the last analyses, four factors were found. The four factors found explained the 49% of the total variance. The scree plot of the instrument is presented below.

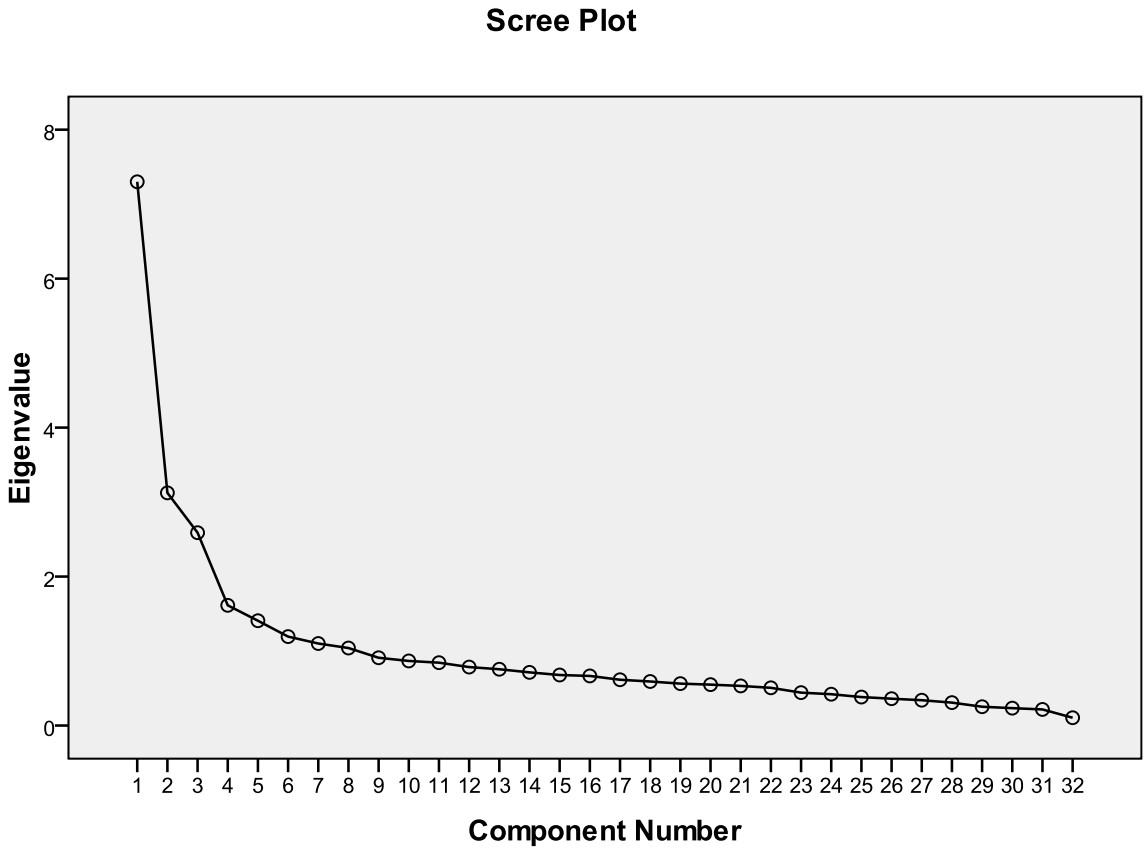


**Figure 1.** The Scree Plot of Coping With Negative Academic Feedback Scale for University Students (CNAFS)

In Figure 1, there were four factors extracted. Principal Components Analysis (PCA) and varimax as the rotation method were selected to develop the factor design of the instrument. The results of PCA revealed that there were ten components, which had an eigenvalue more than 1. The variance explained by these components was 60.47 % totally. After examining the scree plot and the variance table, the contribution of the four components were significant and crucial. For this reason, it was decided to repeat the PCA for the four factors.

For EFA, the acceptance level for factor loadings was 0.32. After carrying out the EFA for four factors, the items were evaluated according to the criteria of overlapping and arriving at the

acceptance level of 0.32. After the evaluation process, seven items were overlapping, and one item was under 0.32 as the acceptance level. Also, the items that showed low item-total correlation were taken out.

In the analysis for four factors, the contributions of the factors to the total variance were as follows: The first factor was 25.602%, the second factor was 9.712%, the third factor was 9.047%, and the fourth factor was 5.109%. The total contribution of the four factors were 49.47%. The explained variance of the instrument is presented in Table 6.

**Table 6.** The Table of Total Variance Explained of the Instrument

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 6,913 | 25,602 | 25,602 | 6,913 | 25,602 | 25,602 | 3,449 | 12,773 | 12,773 |
| 2 | 2,622 | 9,712 | 35,315 | 2,622 | 9,712 | 35,315 | 3,411 | 12,634 | 25,407 |
| 3 | 2,443 | 9,047 | 44,362 | 2,443 | 9,047 | 44,362 | 3,380 | 12,517 | 37,924 |
| 4 | 1,379 | 5,109 | 49,471 | 1,379 | 5,109 | 49,471 | 3,118 | 11,548 | 49,471 |
| 5 | 1,294 | 4,792 | 54,264 | | | | | | |
| 6 | 1,050 | 3,888 | 58,152 | | | | | | |
| 7 | ,989 | 3,664 | 61,816 | | | | | | |
| 8 | ,931 | 3,447 | 65,263 | | | | | | |
| 9 | ,846 | 3,132 | 68,395 | | | | | | |
| 10 | ,791 | 2,931 | 71,326 | | | | | | |

In Table 6, there were four components that are explaining the total variance. The rotated component matrix is presented in Table 7.

**Table 7.** The Table of Rotated Component Matrix

| | Component | | | |
|---|---|---|---|---|
| Items | 1 | 2 | 3 | 4 |
| item22 | .707 | | | |
| item21 | .697 | | | |
| item20 | .684 | | | |
| item23 | .632 | | | |
| item19 | .544 | | | |
| item24 | .481 | | | |
| item3 | .447 | | | |
| item1 | .436 | | | |
| item2 | .348 | | | |
| item8 | | .809 | | |
| item9 | | .795 | | |

| | | | | |
|---|---|---|---|---|
| item7 | .751 | | | |
| item6 | .586 | | | |
| item11 | .533 | | | |
| item4 | .504 | | | |
| item14 | | .788 | | |
| item26 | | .775 | | |
| item25 | | .773 | | |
| item13 | | .757 | | |
| item27 | | .497 | | |
| item17 | | | .736 | |
| item15 | | | .724 | |
| item16 | | | .708 | |
| item18 | | | .690 | |
| item12 | | | .533 | |
| item10 | | | .481 | |
| item5 | | | .480 | |

As seen in Table 7, rotated matrix revealed that the first factor consisted of 9 items, the second factor consisted of 6 items, the third factor consisted of 5 items, and the fourth factor consisted of 7 items. The denominations of the factors were realized according to the general meaning of the total items. The entitlement of the factors were realized referring to the studies of Pekrun (2006), Pekrun et al. (2011), Peixoto et al. (2017), Sharp et al. (2017), Ainscough et al. (2018), Lin et al. (2017), and Bengtsen & Barnett (2017).

As seen in Table 8, the results of EFA demonstrated that the four factors of the scale explained 49.471% of the total variance, item-total correlations were between 0.273 and 0.645; and finally, there were no overlapping items. The factor loadings of the items consisted on the scale between 0.348 and 0.809.

The participants' reactions to each of the subdimensions were grouped as low and high. Then, these groups were compared with independent samples t-test. The results demonstrated that the low and high groups of the items were significantly different. In Table 8, the reliability and validity analyses of the first factor (ineffective coping) are given.

**Table 8.** The Reliability and Validity Analyses of the First Factor (Ineffective Coping)

| | Items | Varimax Factor Loading | Common Factor Variance | Item Total Correlation Coefficient | t | p |
|---|---|---|---|---|---|---|
| Ineffective Coping | item22 | .707 | .59 | .500 | 13.63 | .00 |
| | item21 | .697 | .48 | .466 | 12.52 | .00 |
| | item20 | .684 | .46 | .410 | 10.14 | .00 |
| | item23 | .632 | .39 | .362 | 8.69 | .00 |
| | item19 | .544 | .41 | .645 | 16.56 | .00 |
| | item24 | .481 | .23 | .571 | 12.75 | .00 |
| | item3 | .447 | .19 | .476 | 11.10 | .00 |
| | item1 | .436 | .30 | .452 | 9.99 | .00 |
| | item2 | .348 | .12 | .416 | 10.75 | .00 |

As seen in Table 8, the reliability and validity analyses of the first factor (ineffective coping) are given. Below in Table 9, the reliability and validity analyses of the second factor (Avoidance) are given.

**Table 9.** The Reliability and Validity Analyses of the Second Factor (Avoidance)

| | Items | Varimax Factor Loading | Common Factor Variance | Item Total Correlation Coefficient | t | p |
|---|---|---|---|---|---|---|
| Avoidance | item8 | .809 | .65 | .352 | 7.63 | .00 |
| | item9 | .795 | .63 | .433 | 10.10 | .00 |
| | item7 | .751 | .56 | .377 | 8.95 | .00 |
| | item6 | .586 | .45 | .506 | 11.74 | .00 |
| | item11 | .533 | .28 | .418 | 8.77 | .00 |
| | item4 | .504 | .25 | .273 | 6.23 | .00 |

As seen in Table 9, the reliability and validity analyses of the second factor (Avoidance) are given. In Table 10, the reliability and validity analyses of the third factor (Instant reactions) are presented.

**Table 10.** The Reliability and Validity Analyses of the Third Factor (Instant Reactions)

| | Items | Varimax Factor Loading | Common Factor Variance | Item Total Correlation Coefficient | t | p |
|---|---|---|---|---|---|---|
| Instant Reactions | item14 | .788 | .62 | .503 | 13.69 | .00 |
| | item26 | .775 | .60 | .624 | 17.08 | .00 |
| | item25 | .773 | .59 | .602 | 17.60 | .00 |
| | item13 | .757 | .57 | .483 | 12.32 | .00 |
| | item27 | .497 | .43 | .566 | 16.53 | .00 |

As seen in Table 10, the reliability and validity analyses of the third factor (Instant Reactions) are given. In Table 11, the reliability and validity analyses of the fourth factor (Try-again motivation) are presented.

**Table 11.** The Reliability and Validity Analyses of the Fourth Factor (Try-Again Motivation)

| | Items | Varimax Factor Loading | Common Factor Variance | Item Total Correlation Coefficient | t | p |
|---|---|---|---|---|---|---|
| Try-again Motivation | item17 | .736 | .54 | .338 | 8.64 | .00 |
| | item15 | .724 | .52 | .344 | 7.81 | .00 |
| | item16 | .708 | .50 | .312 | 7.68 | .00 |
| | item18 | .690 | .47 | .370 | 8.22 | .00 |
| | item12 | .533 | .28 | .385 | 8.17 | .00 |
| | item10 | .481 | .34 | .321 | 7.65 | .00 |
| | item5 | .480 | .23 | .285 | 5.83 | .00 |

As seen in Table 11, the reliability and validity analyses of the fourth factor (Try-again motivation) are presented.

Another method for evaluating reliability is comparing the bottom and the top 27% of the groups. The differentiation of the means of these groups was evaluated (Lee et al., 2020). The bottom and top groups were compared by independent samples t-test. As seen in Tables 8, 9, 10 and 11, each item differentiated between the bottom and top groups significantly ($p<.05$). The variances and alpha coefficients of each factor are presented in Table 12.

**Table 12.** The Variances and the Alpha Coefficients of Each Factor of the Scale

| Factors | Item Numbers | Explained Variance | Alpha |
|---|---|---|---|
| Factor 1 (Ineffective Coping) | 9 | %25.60 | 0.806 |
| Factor 2 (Avoidance) | 6 | %9.71 | 0.797 |
| Factor 3 (Instant Reactions) | 5 | % 9.04 | 0.850 |
| Factor 4 (Try-again motivation) | 7 | % 5.10 | 0.762 |
| Total | 27 | %49.47 | 0.883 |

As seen in Table 12, the factor variance explained by each factor is; 25.60%, 9.71%, 9.04%, 5.10%, and a total of 49.47%. The alpha coefficient of the first factor (ineffective coping) is 0.806, the alpha coefficient of the second factor (Avoidance) is 0.797, the alpha coefficient of the third factor (Instant Reactions) is 0.850, and the alpha coefficient of the fourth factor (Try-again motivation) is 0.762. The ineffective coping subdimension consists of thoughts and attitudes that decrease the motivations of the individual after encountering negative academic feedback. The avoidance subdimension consists of the avoidant attitudes of the individual after encountering negative academic feedback. The instant reaction subdimension consists of the feelings the individual experiences just immediately after the individual gets to know about the negative feedback. Try-again motivation subdimension consists of the attitudes of the individual that sum up the psychological resources and motivation for the studies afterwards. The scale consists of multiple components and also has an additivity qualification. So the internal consistency is computed and found at 0.883. Thus, the scale has high reliability. The internal consistency coefficients of the instrument are presented in Table 13.

**Table 13.** The Internal Consistency Coefficients of the Instrument (Split-Half)

| Cronbach alpha | | | Spearman-Brown Coefficient | | | |
|---|---|---|---|---|---|---|
| Part 1 | Part 2 | N | Correlation between forms | Equal length | Unequal length | Guttman Split-Half Coefficient |
| .805 | .845 | 27 | .576 | .731 | .731 | .728 |

Besides Cronbach alpha reliability coefficients, split-half reliability was also examined. The items of the instrument were divided into two groups. The reliability coefficients found for the two groups are .805 and .845. The correlation between the two groups is positive (r= .576). Besides that Guttman and Spearman-Brown coefficients are also presented (Guttman: .728; Equal-length: .731; Unequal-length: .731). Consequently, the instrument was reliable. In Table 14, the means and correlation coefficients of the sub-scales of the instrument are given.

**Table 14.** The Means and Correlation Coefficients of the Sub-Scales of the Instrument

| Factors | N | X | 1st factor | 2nd factor | 3rd factor | 4th factor |
|---|---|---|---|---|---|---|
| 1st factor | 450 | 32.84 | - | - | - | - |
| 2nd factor | 450 | 21.29 | .376** | - | - | - |
| 3rd factor | 450 | 15.04 | .635** | .301** | - | - |
| 4th factor | 450 | 25.54 | .322** | .237** | .283** | - |

In Table 14, the correlation coefficients were significant and positive between the factors. The CFA approach sought to examine the extent to which a highly constrained a prior factor structure is consistent with the sample data (Byrne, 2005). In this context, the fit indexes of the model consisting of four dimensions of the instrument were examined. The t values and factor loadings were examined and found nothing problematic.

In this study, the Chi-square goodness of fit test, GFI, RMSEA, CFI, NFI, RFI, IFI, and AGFI were examined as the fit indexes. For RMSEA, a value equal to or under 0.05 means good fit; a value equal to or under 0.08 indicates an acceptable fit index (Browne & Cudeck, 1992; Rigdon, 1996). In CFA, the fit indexes of the four factors of the instrument were examined. The findings of the first order CFA are presented in Figure 2.

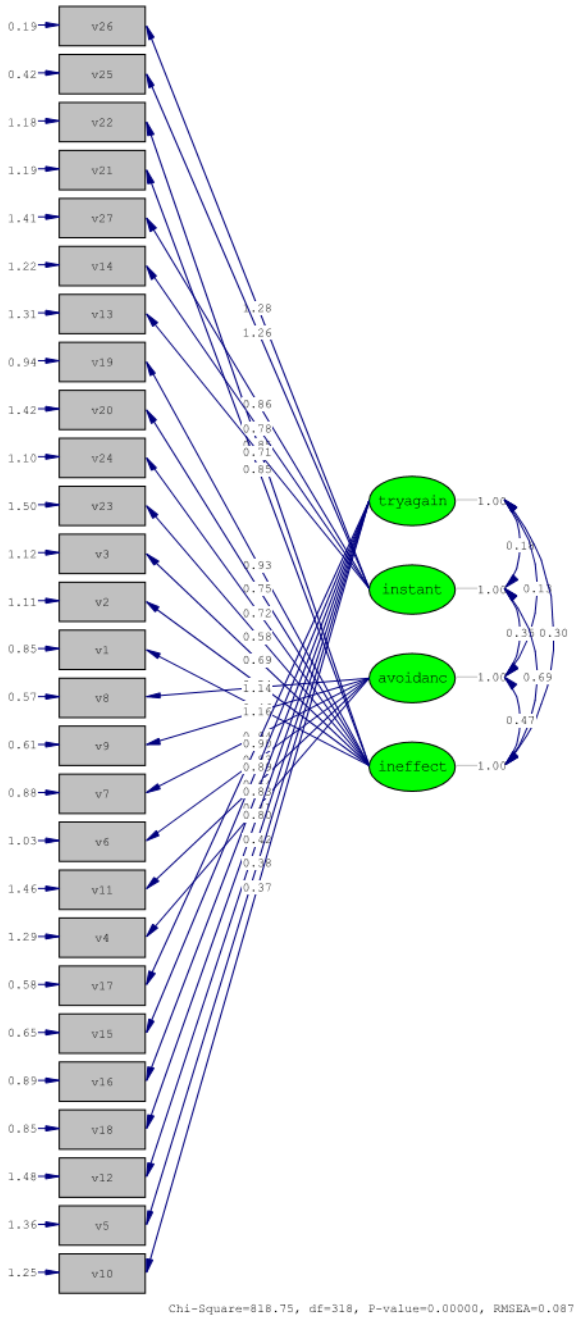


**Figure 2.** The Findings of the First Order CFA

Whether "coping with negative academic outcomes" as a latent variable is explained by the dimensions "ineffective coping," "avoidance," "instant reactions," and "try-again motivation" was examined by second-order CFA. When the findings of the second order CFA were investigated, the factor loadings of the 27 items of the instrument were between 0.29 and 0.99. The t values were examined and no problematic values were found. This fit indicated that the relation between latent variables and variables was significant ($p<0.05$). The second order CFA is shown in Figure 3.

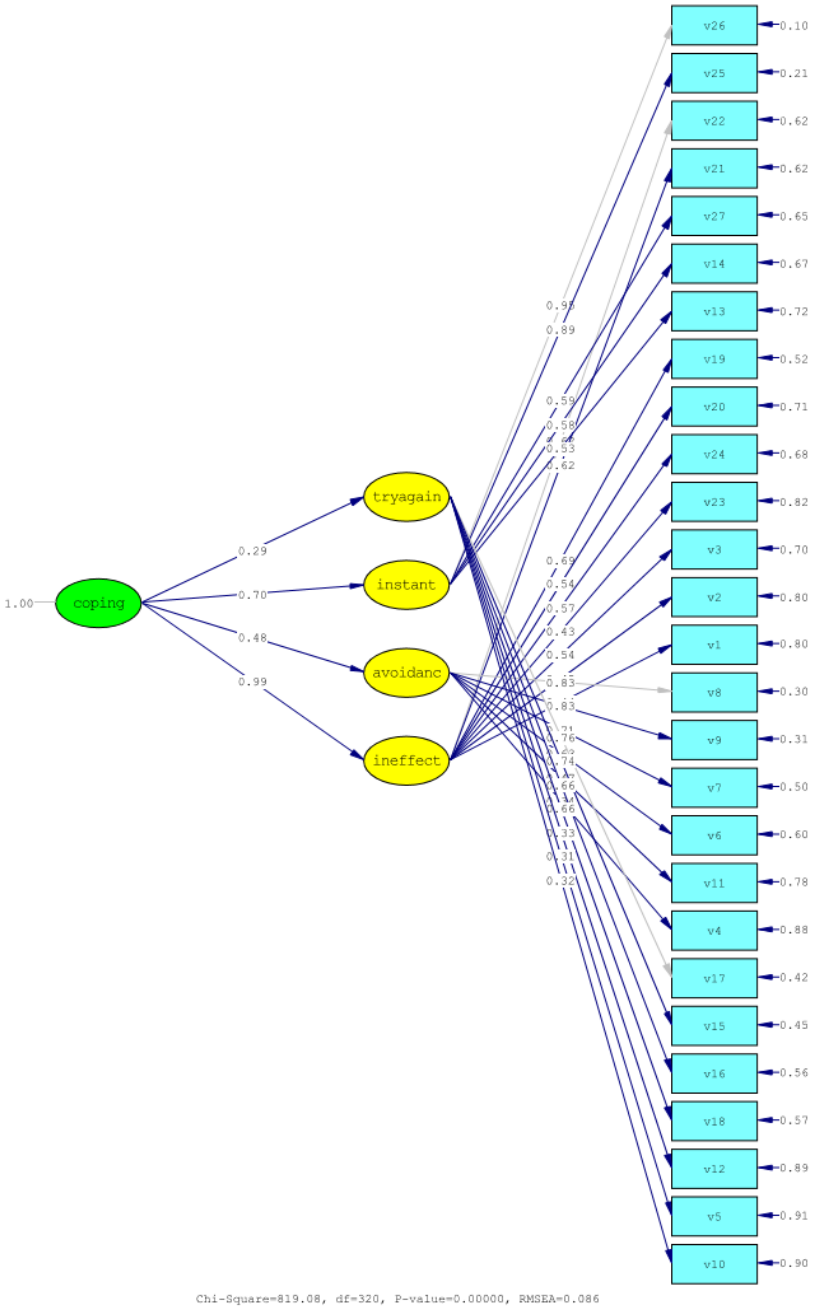


**Figure 3.** The Findings of the Second Order CFA

The $\chi^2$/ df ratio of the second order CFA was 2.55. The fit indexes are presented in Table 15 with the reference values taken from the literature.

**Table 15.** The Fit Indexes Found in this Study and the Reference Values

| Fit Indexes | Perfect Fit Indexes | Acceptable Fit Indexes | Calculated Fit Indexes of this model |
|---|---|---|---|
| [1]AGFI | .90 ≤ AGFI ≤ 1.00 | .85 ≤ AGFI ≤ .90 | .72 |
| [2]GFI | .95 ≤ GFI ≤ 1.00 | .90 ≤ GFI ≤ .95 | .77 |
| [2]CFI | .95 ≤ CFI ≤ 1.00 | .90 ≤ CFI ≤ .95 | .80 |
| [2]NFI | .95 ≤ NFI ≤ 1.00 | .90 ≤ NFI ≤ .95 | .78 |
| [2]NNFI(TLI) | .95 ≤ NNFI ≤ 1.00 | .90 ≤ NNFI ≤ .95 | .81 |
| [2]RFI | .95 ≤ RFI ≤ 1.00 | .90 ≤ RFI ≤ .95 | .81 |
| [2]IFI | .95 ≤ IFI ≤ 1.00 | .90 ≤ IFI ≤ .95 | .84 |
| [3]RMSEA | .00 ≤ RMSEA ≤ .05 | .05 ≤ RMSEA ≤ .08 | .08 |
| [3]SRMR | .00 ≤ SRMR ≤ .05 | .05 ≤ SRMR ≤ .10 | .09 |
| [4]PNFI | .95 ≤ PNFI ≤ 1.00 | .50 ≤ PNFI ≤ .95 | .75 |

References: [1](Schermelleh-Engel et al., 2003), [2](Baumgartner & Homburg, 1996; Bentler, 1980; Bentler & Bonett, 1980), [3](Browne & Cudeck, 1992), [4](Hu & Bentler, 1999).

As a result of the analyses, the fit indexes NNFI=0.81; CFI=0.80; IFI=0.84 ve RMSEA=0.08 were found. The fit indexes shown in Table 15 were compared to the reference values. Consequently, it was discovered that both the elements of the subdimensions and the model that contained them were validated.

## 5. Discussion

It is significant for university students to continue the motivation to attend regularly the courses in order to adapt to university life and cope with the problems they face in university (Ainscough et al., 2018). The students' major problems in academic study are taking lower grades than expected (Ross et al., 1999) and the fear of being evaluated (Kocovski & Endler, 2000).

It is predicted that a university student's feelings and opinions about oneself and the course may affect his focusing rate on the course, and start studying again after he has encountered an academic feedback worse than expected. Emotions play a significant role in academic domain, for instance, the anxiety of a student during an exam increases if the student perceives the performance as out of his control (Pekrun et al., 2010). Conversely, the success of learning affects the evaluations and feelings of the students (Pekrun, 2006).

It is important how a student considers the triggered feelings after encountering negative academic feedback. Optimist individuals can persevere the belief that they can reach success despite the negative feeling. Also, self-regulation skills function as a protective factor against the negative feelings, such as frustration and anxiety (Asikainen et al., 2018).

On the contrary, the contexts that damage the students' sense of control create destructive effects on the students' motivation in the future (Hootstein, 1994). The hopelessness for the evaluation is destructive to academic performance as a negative and repressing effect. Students who feel continuously hopeless in the evaluation processes show less effort, and this process results in lower success (Burić & Sorić, 2012). These situations emphasize the vital importance of coping with a negative academic feedback.

A student may withdraw from a source of negative academic feedback. Moreover, the individual may cope with the threat to the self-value by the strategies like self-sabotaging and defensive pessimism (Martin et al., 2003), and may experience learned hopelessness as a consequence of the failure (Au et al., 2010). In addition, he may feel boredom as a consequence of the lessening interest and positive feelings for the course (Pekrun et al., 2010). This situation is a motivational obstacle that inhibits learning (Pekrun, 1992). For this reason, continuing to study after encountering negative academic feedback seems to be dependent on the motivation for trying-again. Students' feelings mediate the relationship between goals and success (Daniels et al., 2009), so the try-again motivation of the student is related to various qualifications like psychological flexibility and self-regulation.

Psychological flexibility supports the skill of being related to the moment. An individual can regulate his behavior according to the primary goal of the moment (Hayes et al., 2006). Psychological flexibility is related to the rhythm of studying, and the students who feel themselves competent despite the negative feelings can continue studying more successfully (Asikainen et al., 2018). Self-regulation is also related to the academic feelings and related conversely to frustration, embarrassment, and anxiety (Asikainen et al., 2018). When the student encounters negative academic feedback, he should realize the emotions and then he should regulate the feelings and thoughts for trying-again.

Making all these regulations seem related to coping with negative academic feedback. It is pleasing that the majority of the students continue studying with perseverance and complete their courses despite the former failure (Ajjawi et al., 2020). In addition, it is hopeful that coping skills may be supported by mindfulness-based interventions in the case of difficult personality qualities like perfectionism (Çatak & Ögel, 2010; Koerten et al., 2020).

This study was realized to develop an instrument to assess the coping of university students after encountering a negative academic feedback. In this study, primarily semi-structured interviews were conducted with volunteer university students to develop this scale of coping with a negative feedback. In the interviews, the students were asked about how they cope with a negative academic feedback. Managing the answers taken in the interviews, an item pool was constructed consisting of 48 items. The application was conducted with 450 university students from various faculties. According to the results of the testing application, 21 items were discarded and 27 items remained. The scale consists of four factors; the first factor (nine items), the second factor (six items), the third factor (five items), and the fourth factor (seven items). Additionally, an internal consistency coefficient was found 0.883. As a consequence of the exploratory factor analysis and thereafter the confirmatory factor analysis, the items in the first factor (22, 21, 20, 23, 19, 24, 3, 1, 2) evaluated ineffective coping, and the items in the second factor ( 8, 9, 7, 6, 11, 4) evaluated the avoidance from the feelings and thoughts triggered by encountering negative academic feedback, the items in the third factor (14, 26, 25, 13, 27) evaluated the instant reactions of the individual when encountered with negative academic feedback and the items in the fourth factor (17, 15, 16, 18, 12, 10, 5) evaluated the try-again motivation despite the negative academic feedback. The findings of the exploratory factor analysis show that the item-total correlations are between 0.273 and 0.645; the factor loadings are between 0.348 and 0.809, and 49.471% of the total variance is explained. The findings of the confirmatory factor analysis show that the instrument that consisted of 27 items and four subdimensions had partially consistent fit indexes.

RMSEA and RMR values were slightly over the acceptable value (> .080); NFI, CFI, IFI, RFI, AGFI and GFI values were under the acceptable value (< .90) fairly. the modifications realized damaged the structure. Therefore, it is recommended that the confirmatory factor analysis should be repeated in the following studies. On the other hand, it is seen that the factor loadings of each item was minimum .30 and there was no problem in t-values and factor loadings. The items of the first, second and third factors were scored reversely. The minimum score of the scale was 27 and the maximum score of the scale was 135.

## 6. Conclusion

The student who does not have the coping ability to continue taking the course despite negative feedback(s) may be at various risks. For this reason, coping with negative feedback is a significant variable for assessment. Thus, the education system in the university can assess the students who are struggling to cope with failure/potential failure. In addition, in this way, psychological and academic support may be provided for these students. The instrument developed for university students is a valid and reliable tool. Consequently, CNAFS can be used to assess the level of coping with negative academic feedback in university students. And finally, this study can be a step forward for comprehending and identifying the processes of coping with negative academic feedback, as the literature about this issue seems to need getting matured.

## Limitation

This study has a limitation on the theoretical literature on coping with an academic negative outcome. However, this study aims at enhancing the theoretical structure of coping with the negative outcomes of university students. Therefore, the limitation is at the same time strength of this study.

## Recommendation

It is recommended that the instrument is applicated to university students and checked whether this instrument is an applicable tool for assessing the coping of university students' with negative academic outcomes.

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## Conflict of Interest

The researchers declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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