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A study of the validity and reliability study of the homework purpose scale: A psychometric evaluation

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ABSTRACT

This paper describes the initial psychometric evaluation of the Homework Purpose Scale (HPS), taking an illustration form practice in one country where it is used. The Homework Purpose Scale was designed to measure homework purpose. Both exploratory and confirmatory factor analyses were performed on samples of undergraduate students ($N = 443$). Results showed that the factor structure of the Turkish version of the HPS (where the study was carried out) was largely similar to the original one in the US. Moreover, each subscale demonstrated high internal consistency, and as predicted was correlated with theoretically related homework measures and other relevant constructs, along with displaying temporal stability. In brief, initial results indicate that the version of the HPS used here is a reliable and valid multidimensional measure for determining homework purpose.

1. Introduction

Homework is one of the most frequent teaching techniques requiring utmost attention at all levels of schools. Homework is a way of supporting what students learn in class, sometimes in the form of group work or sometimes as an individual study. It has different objectives, ranging from revision of the newly learnt topic, or expansion of the previously learned item or preparation for the next class to be taught [7,6,8,10,18,42,56]. In general, homework is regarded as an extension of classroom teaching and is one of the influential tools in gaining new experiences and in increasing the importance of teaching/learning activities [2,34]. Homework is a kind of assistant, helping learners across the broader of classroom to digest what they have been taught at school when they are out of school hours. Doing homework is also a way of developing students' individual study habits and of guiding them to get the responsibility of their own learning. Hence, the aim of an ideal assignment should be to teach students studying independently, planning efficiently, getting organized in group assignments and thinking individually [35].

Homework usually has multipurpose [3,9,11,17–19,31,40–42]. As Epstein and Van Voorhis [18], list, homework employs 10 purposes namely practice, preparation, participation, personal development, parent–child relations, parent–teacher communications, peer interactions, policy, public relations, and punishment. Subsequently, Van Voorhis [41] further categorised these 10 purposes into three groups: instructional (i.e., the first four purposes), communicative (i.e., the next three purposes), and political (i.e., the final three purposes). From a slightly different angle, Cooper et al. [9] divided the purposes of homework into two broad groups, including instructional (e.g., review, practice, preparation, extension, and integration) and noninstructional (e.g., communication between parent and child, fulfilling directives from school administrators, public relation, and punishing students) [9,44,12,22,42].

Several recent studies revealed children's understanding of the purposes of homework. In a qualitative study, for example, Xu and Corno [53] examined the purposes of homework held by elementary school students, their parents, and teachers. Data showed that the parents and

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teachers shared similar views about purposes for doing homework (e.g., reinforcing school learning). Whereas, children view homework as one route to gain approval from their parents and teachers.

Similarly in another qualitative study, Xu and Yuan [56] compared homework purposes as perceived by middle school students, their parents, and teachers. All the participants indicated that one purpose for doing homework was to review and reinforce what students learned in class. Students further stated that they did homework to comply with teachers' or/and parents' expectations.

In another survey study, Cooper et al. [8] compared homework attitudes as perceived by secondary school students, their parents, and teachers. Results showed that student attitudes toward homework were significantly more negative than were found either among parents or teachers, suggesting that there is a remarkable difference in homework attitudes held by students and adults.

Research to date indicate a positive relationship between doing homework and students' achievement [28,8,36]. Moreover; studies also suggest that homework assignments are mostly more effective on the scores of students from higher classes namely grades 6–10. On the other hand, a contrary situation is seen with lower level grades (2–4). This negative relationship is also reinforced by the findings about students' psychology. Related research findings have shown a negative effect on students doing homework [29]. These results imply the probable negative effects of homework on students.

Teachers at the elementary level are in favor of the idea that homework assignments, themselves, are important as they help students to learn how to control their time regardless the homework topic given to them. At elementary level it is difficult to observe the relationship between homework and student's actual performance in exams [31].

The focus on how homework purposes as perceived by Elementary School Teacher Education students is particularly important, as they usually have been left out of the public discussions on homework [30,42,43]. It would be beneficial to determine the pattern of homework purpose of students who become teacher at the elementary school level in Turkey. Before any homework-help strategies are rendered, it is important that to understand Turkish teacher education students' homework purpose as they influence homework process and completion.

Along with relevant literature tapping into homework purposes (e.g., [6,18,32,42]), Xu [50,51] conducted an exploratory factor analysis (EFA) to ascertain the underlying factor structure of a set of homework purposes. The homework purpose instrument consisted of 15 items, The EFA results indicated that the 15 homework purpose statements could be reduced to a three-factor structure. One factor was labeled as Learning-Oriented Reasons, consisting of nine items relating to school learning (whether it is about academic progress or self-regulation). The second factor was labeled as Adult-Oriented Reasons, consisting of three items relating to gaining approval from their significant others (parents and teachers). The third factor was labeled as Peer-Oriented Reasons, consisting of three items relating to their peers. Alpha reliability coefficients for scores on these three factors were .90, 79, and .79, respectively.

Following that, the validity of scores on the HPS for middle school students was tested by Xu [52] through the use of confirmatory factor analysis (CFA), using 1181 eighth graders. Findings pointed out that nine items measured learning-oriented reasons (Cronbach's $\alpha = 89$), linking to reinforcing school learning and developing a sense of responsibility. Then, three items addressed adult-oriented reasons (Cronbach's $\alpha = .79$), in a relation to seeking approval from parents and teachers. Peer-oriented reasons were measured by three items (Cronbach's $\alpha = .76$), relating to working with and seeking approval from peers. These reliability estimates are in line from adequate to good range [23]. This result highlights that the HPS is a factorially valid measure to work on homework purpose of middle school students [50]. Therefore, in the related studies, it can be suggested to use as a general measure of homework purpose for both preadolescents and adolescents. This was also claimed by related findings of the previously conducted study [50,52]. This study indicated that (a) the scale consisted of the same three factor structure for middle and high school students; (b) for both middle and high school students, internal consistency reliability coefficients of the subscales were in adequate to good range; and (c) the subscales were positively related to desirable homework behaviors and was negatively linked to undesirable homework behaviors, which has been theoretically expected as well.

For follow-up studies, it is suggested to focus on the validity of scores on the HPS with students from different cultural backgrounds, because student attitudes toward homework may be affected by cultural differences relating to perceived values of doing homework by significant others (Wigfield, Tonks, & Eccles, 2004, cited in [52].

Turkish studies directed to homework which is quite important as an out-of-class teaching activity in Turkish Education System are limited in both theme and number [1,2,5,13,21,24,26,57,58]. In these studies, the effect of homework on academic achievement, the relationship between the academic achievement and the time spent on homework, the problems encountered while doing homework, the link between the amount of homework and students' attitudes towards homework and homework-doing styles were investigated. Within the scope of the available related studies, no research was seen aiming to discover students' homework purposes and there is no scale to date to measure homework purposes from a multidimensional perspective. In fact, in order to decrease the number of homework-related problems, it is crucial to investigate students–teachers' homework purposes.

The present research is supposed to be of utmost importance to the student–teachers' who are actually in the pre-service teacher training programs, in the manner of decision making process on homework, preparation, organization, practice and evaluation of homework assignments. Through the adaptation of Homework Purpose Scale (HPS) measurement tool, student teachers' perceptions on aims of homework and in relation to this, some variables such as attitude and achievement can be investigated.

Also, it has been investigated that in the related field HPS has not been used with university students, but with

primary and secondary students. The Turkish education system has begun shifting its instructional approach from teacher- to learner-centred and the Turkish Ministry of National Education has indicated the importance of education at home and workplaces as well as in school [37–39]. The Ministry of National Education in Turkey modified the curriculum of basic courses such as knowledge of life, science, social sciences, Turkish language and mathematics in 2005 [38]. With these changes, education at school is regarded as actual life, rather than a preparation period for later life. In order to reinforce the new policy, active participation in class activities and experiential learning have been a target of implementation. The overall objectives of Turkish National Education policy suggest that education takes place not only in schools, but also at home and workplaces. Therefore, learning at home and doing homework has become a more prominent issue in Turkey in the last 10 years. That's why, the findings of this study will be of interest to the pre-service teacher training programs. The lacking points may be seen and compensated.

Therefore, the aim of the present study was to validate scores on the homework purpose instrument for Elementary School Teacher Education students. Specifically, the purposes of the present study were (a) to examine the factor structure of the Homework Purpose Scale (HPS) with a sample of Elementary School Teacher Education students (b) to test the best-fitting model for Elementary School Teacher Education students and (c) to test construct and concurrent validity by examining the relationship between scores on the HPS and scores assessing relevant homework behaviors (e.g., homework management strategies and homework completion) and homework attitude.

2. Method

2.1. Participants

The validity and reliability of the HPS scores were assessed based on data collected during 2010–2011 academic year, 443 students 275 female (62.1%) and 168 male (37.9%) the first, second, third and fourth class students of a university, located in the southern part of Turkey. The sample include 90 first, 103 second, 140 third, 110 fourth grade Elementary School Teacher Education students.

2.2. Instruments

2.2.1. The Homework Purpose Scale (HPS)

The HPS developed and validated by Xu [50,52] is composed of 15 items using a 4-point response format in which students are asked to select a response from 1 (*strongly disagree*), 2 (*disagree*), 3 (*agree*), or 4 (*strongly agree*). The scale comprises three subscales, including (a) Learning-Oriented Reasons (9-item subscale, e.g., "doing homework helps you understand what's going in class"), (b) Adult-Oriented Reasons (3-item subscale, e.g., "doing homework brings you family approval"), and (c) Peer-Oriented Reasons (3-item subscale, e.g., "doing homework gives you opportunities to learn from classmates"). Based on the results of the study of secondary school students [51], alpha reliability coefficients for scores on these three subscales were .90 for Learning-Oriented Reasons, .79 for Adult-Oriented Reasons, and .79 for Peer-Oriented Reasons. Subsequently, Xu [52] tested the validity of scores on the HPS for middle school students eighth graders. Alpha reliability coefficients for scores on these three subscales were .89, .79 and .76 respectively.

2.2.2. Homework Management Scale (HMS; [48,49])

The HMS is composed of 22 items using a 5-point response format, in which students are asked to select a response from 1 (*never*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), or 5 (*routinely*). It comprises five subscales, including (a) arranging the environment (5-item subscale, e.g., "find a quiet place"), (b) managing time (4-item subscale, e.g., "set priority and plan ahead"), (c) handling distraction (5-item subscale, e.g., "stop homework to send or receive instant messaging"), (d) monitoring motivation (4-item subscale, e.g., "find ways to make homework more interesting"), and (e) controlling emotion (4-item subscale, e.g., "calm myself down"). Of the 22 items in the HMS, 5 items were reverse scored. Alpha reliability coefficient for scores on the five subscales were .75, .74, .74, .83, and .80, respectively.

In addition, the students were asked, "How much of your assigned homework do you usually complete?" Possible responses include 1 (*none*), 2 (*some*), 3 (*about half*), 4 (*most*), and 5 (*all*). The students were also asked, "How often do you come to class without your homework?" Possible responses include 1 (*never*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), and 5 (*routinely*).

2.2.3. Homework attitude scale

The homework attitude scale developed by Gündüz [20] is composed of 31 items using a 5-point response format in which students are asked to select a response from 1 (*strongly disagree*), 2 (somewhat *disagree*), 3 (moderately *disagree*), 4 (quite *agree*), or 5 (*strongly agree*). The scale comprises three subscales, including (a) The Importance and Benefit of Homework (12-item subscale, e.g., "homework, is not noting more than copies of existing information"), (b) Homework-related Affective Attitudes (14-item subscale, e.g., "the idea of doing homework is troubling"), and (c) Homework Preparation Status (5-item subscale, e.g., "homework should be made no matter what the circumstances"). Based on the results of Gündüz study, alpha reliability coefficients for scores on these three subscales were .94 for The Importance and Benefit of Homework, .93 for Homework-related Affective Attitudes and .69 for Homework Preparation Status. In the present study alpha reliability coefficients for scores on these three subscales were .92 for The Importance and Benefit of Homework, .92 for Homework-related Affective Attitudes and .70 for Homework Preparation Status.

2.2.4. Demographic information

A separate questionnaire was used to obtain participants' grade, gender and socio-economic status (SES). Questionnaire items include parents' educational background and professions, the number of family members, the number of rooms in their house, monthly income of the family, the air-conditioning facilities of houses, family belongings (e.g. refrigerator, washing machine, television

and computer) and whether the family owns the house they live in or not. A score was given to each answer according to the rubric. Responses to the questionnaire were aggregated for each person.

2.3. Procedure

The HPS was translated into Turkish by three academics (including the author) who were competent in both written and spoken English. The translated forms were reviewed and compared with one another in terms of the content and clarity of the items. In addition the Turkish form was reviewed by two Turkish Literature instructors to assess the appropriateness of the grammatical structure of the items. The final Turkish version was back translated into English by two academicians, then it was compared with the original scale. The back-translated version was found to be very similar to the original. The team, then, discussed any discrepancies between the translated and back-translated items until the members reached a consensus.

The data were gathered from a sample of undergraduate students in Faculty of Education Elementary School Teacher Education Department at the University of Çukurova. The measures were administered to the participants in different courses by the researcher. The researcher herself administered the questionnaire explaining the purpose of the study and assured the students of the confidentiality of their responses. The instructions were read aloud. Participation in the study were voluntary. Participants were asked not to write their names or identifying information on any of the questionnaires, to ensure their anonymity. They completed a demographic questionnaire and a package of measures. Completing the questionnaire package took approximately 30 min. A trained research assistant was present throughout the administration of the test. All participants completed the demographic questionnaire and homework measures on each occasion. Twenty-five participants were dropped from the study due to incomplete data, yielding a final sample of 443 students. The data were factor-analyzed using SPSS for Window Version 11.5 and Lisrel 8.70. Exploratory factor analysis (EFA) is performed to examine the factor structure of the scale according to the data obtained from this study sample and confirmatory factor analysis (CFA) is performed to examine the original scale's structure approved by Turkish experts in Turkish culture. The correlations between the total scores of component-factor are calculated. Pearson correlation coefficients were calculated (a) between each subscale of the HPS and each subscale of the HMS, (b) between each subscale of the HPS and the amount of homework completed by students, and (c) between each subscale of the HPS and the reported frequency of coming to class without homework, (d) homework attitude scale

3. Results

3.1. Factor analyses

3.1.1. Exploratory factor analysis

Prior to conducting the EFA, we examined two indicators to determine whether the sample was appropriate for such an analysis. The Kaiser–Meyer–Olkin measure of sampling adequacy index was .897, and Bartlett's test of sphericity was significant, X^2(df: 105, N = 443) = 2751.032 p < .0001, indicating that the sample and correlation matrix were appropriate for such an analysis. Principal component analysis with an promax, kappa 4 was performed on the scores of the 15-item HPS. An promax, kappa 4 was used because the factors expected to be correlated was done to determine the factor structure of the scale. This decision was based on conceptual clarity, interpretability and theoretical salience of the rotated factors, and simple structure.

Factor pattern coefficients of the three subscales of the HPS for the sample of this study are presented in Table 1 the three-factor solution accounted for 59.63% of the total variance. The first factor (Learning-Oriented Reasons) accounted for 39.12%, the second factor (Adult-Oriented Reasons) accounted for 12.71% and third factor (Peer-Oriented Reasons) accounted for 7.80% of the total variance. All items loaded on the same subscales as in the original HPS

3.1.2. Confirmatory factor analysis

To examine the adequacy of the three-factor structure that was yielded through exploratory factor analysis, a confirmatory factor analysis of the 15-item scale was conducted using the LISREL 8.70 [27]. The hypothesized model comprised three first-order latent variables representing three subscales, with each variable having 9 (learning-oriented reasons), 3 (adult-oriented reasons) and 3 (peer-oriented reasons) indicators. This hypothesis was based on previous research which suggests that three factor structure provided the best fit for the HPS [50]. As can be seen in Table 2 by using maximum likelihood estimation, the results indicated that the hypothesized 3-factor model represented an acceptable fit to the data, with all of the following cutoff criteria for fit indices outlined by Hu and Bentler [25] in Turkish HPS either the "good" [comparative fit index (CFI), goodness of fit index (GFI), incremental fit index(IFI)] or "fair" [root mean squared error of approximation (RMSEA)] for the current sample.

In sum, the results of confirmatory factor analyses provided further support for the construct validity of the HPS' subscales.

3.1.3. Descriptive and inferential statistics

With respect to descriptive statistics for the sample (n = 443), the means for the three subscales were as follows: 28.11 (SD = 4.39) for Learning-Oriented Reasons, 8.16 (SD = 2.05) for Adult-Oriented Reasons, 8.29 (SD = 1.82) for Peer-Oriented Reasons and reliability coefficients for scores on the three subscales were .87 for Learning-Oriented Reasons, .74 for Adult-Oriented Reasons, and .77 for Peer- Oriented Reasons. These reliability estimates are in the adequate to good range [23,33]. Item–total correlations ranged from .568 to .842 (mean item–total correlation .705), indicating good homogeneity.

3.1.4. Concurrent and discriminant validity

To examine the concurrent validity of the HPS, the researcher examined the relationship between scores on the HPS and scores assessing related homework behaviors.

Table 1
Items and oblique rotated factor pattern coefficients for the HPS.

Items number	Factors		
	1	2	3
Learning-oriented reasons subscale			
4. Doing homework helps develop a sense of responsibility	.806		
3. Doing homework gives you opportunities to practice skills from class lessons	.795		
6. Doing homework helps develop good discipline	.756		
1. Doing homework helps you understand what's going on in class	.753		
2. Doing homework helps you learn how to manage your time	.748		−.272
7. Doing homework helps you learn study skills	.673		
5. Doing homework helps you learn to work independently	.670		
13. Doing homework helps you prepare for the next lesson	.542		.293
12. Doing homework helps you get a good grade	.509		
Adult-oriented reasons subscale			
10. Doing homework brings you family approval		.935	
9. Doing homework brings you teacher approval		.781	
8. Doing homework makes your family more aware of your learning at school	.244	.475	
Peer-oriented reasons subscale			
14. Doing homework gives you opportunities to work with classmates	.209		.888
15. Doing homework gives you opportunities to learn from classmates			.877
11. Doing homework brings you approval from classmates	−.224	.214	.771

Note: $N = 443$. HPS = *Homework Purpose Scale*: (a) Items scores on a scale from 1 (strongly disagree) to 4 (strongly agree).

Table 2
Summary of fit indices from confirmatory factor analysis.

χ^2	df	χ^2/df	RMSEA	SRMR	NNFI	GFI	CFI	IFI
318.25	87	3.658	0.053	0.045	0.96	0.93	0.97	0.97

Note: CFI = comparative fit index; GFI = goodness of fit index; IFI = incremental fit index; RMSEA = root mean squared error of approximation.
$p < .05$.

As the significance students attach to academic tasks is critical for the efforts they will contribute to the endeavor and the persistence they will display [14–16], as their views about homework play an important role on their homework behaviors [4,8,42,44,47], including homework management strategies that they use to aid homework completion regardless of the task's content or difficulty [45,46,54,55], the researcher hypothesized that each scale of the HPS would be positively correlated with homework management strategies. As illustrated in Table 3, correlations coefficients among these variables were all positive and statistically significant, with (a) small- to medium-sized coefficients between learning-oriented reasons and homework strategies ($.116 \leqslant r \leqslant .303$), (b) small sized coefficients between adult-oriented reasons and homework strategies ($.130 \leqslant r \leqslant .189$) except handling distractions and (c) small- sized coefficients between peer-oriented reasons and monitoring motivation-controlling emotion ($.119 \leqslant r \leqslant .127$).

The researcher further examined correlations of subscales of the HPS with the amount of homework completed by students as well as the reported frequency of coming to class without homework. Analyses revealed significant correlations among the scores of the two HPS subscales (learning-oriented reasons and adult-oriented reasons) and the amount of homework completed by the students and also the frequency of coming to class without completing homework assignments. More specifically, the learning-oriented reasons and adult-oriented reasons subscales of HPS were positively and significantly associated with the amount of homework completed by the students. Furthermore, the same subscales of HPS were negatively associated with the frequency of coming to class without completing homework assignments. However, the peer-oriented reasons subscale of HPS was not related neither to the amount of homework completed by the students, nor to the frequency of coming to class without completing homework assignments. In addition, the magnitude of coefficients was similar to the coefficients between subscales of the HPS and homework strategies, in the sense that learning-oriented reasons (as compared with peer-oriented reasons and adult-oriented reasons) were more strongly associated with the amount of homework completed by students and the frequency of coming to class without homework.

The relationship between HPS and homework attitude scale was also examined. The researcher hypothesized that each scale of the HPS would be positively correlated with homework attitude sub scale. As illustrated in Table 3, correlations coefficients among these variables were all positive and statistically significant, with small- to high-sized coefficients between HPS sub scale and homework attitude sub scale ($.115 \leqslant r \leqslant .631$). Taken together, all correlations were of magnitude and direction consistent with theoretical expectations, thereby providing further support to the validity of the HPS.

Table 3
Correlations and internal consistency of the homework purpose, homework behaviors and homework attitude.

Homework behaviors and homework attitude	Learning-oriented reasons ($\alpha = 0.87$)	Adult-oriented reasons ($\alpha = 0.74$)	Peer-oriented reasons ($\alpha = 0.77$)
Homework management strategies			
Arranging the environment ($\alpha = 0.72$)	.303**	.189**	.041
Managing time ($\alpha = 0.70$)	.296**	.141**	.080
Handling distraction ($\alpha = 0.83$)	.116*	.015	−.052
Monitoring motivation ($\alpha = 0.70$)	.192**	.130**	.119*
Controlling emotion ($\alpha = 0.82$)	.232**	.163**	.127**
The amount of homework students completed	.253**	.110*	.025
The frequency of coming to class without homework	−.279**	−.123**	−.068
Homework attitude scale			
The importance and benefit of homework ($\alpha = 0.92$)	.631**	.329**	.303**
Homework-related affective attitudes ($\alpha = 0.92$)	.425**	.172**	.115*
Homework preparation status ($\alpha = 0.70$)	.382**	.248**	.180**

* $p < .05$.
** $p < .01$.

As illustrated in Table 3, internal consistency estimates (Cronbach's alpha) for the HPS subscale scores ranged from .74 to .87 (mdn = .81) for homework management strategies from .70 to .83 (mdn = .77) for homework attitude scale, from .70 to .92 (mdn = .81). In sum for all scale the internal consistency coefficient was within adequate ranges.

4. Discussion

The purpose of this study was twofold; first, to adapt the HPS for Turkish Elementary School Teacher Education students, and second to examine its psychometric properties. The findings indicated that the Turkish version of the HPS has acceptable reliability and validity, and support the existence of three separate yet related dimensions: Learning-Oriented Reasons, Adult-Oriented Reasons, and Peer-Oriented Reasons of homework purposes. More specifically, the results from exploratory and confirmatory factor analyses provide support for the three factor structures (Learning- Oriented Reasons, Adult- Oriented Reasons, Peer-Oriented Reasons) of the HPS. This result is consistent with previous findings that indicated the HPS has three factors [44,50,52]. In addition, results showed that the three subscales of the HPS were positively associated with homework management strategies, the amount of homework completed by students and homework attitude and were negatively associated with the frequency of coming to class without homework.

Looking at the results, the HPS appears to be an efficient, practical, and factorially valid measure of homework purpose of Turkish Elementary School Teacher Education students. This is further substantiated by findings from the present study, which suggest the scores on the HPS were positively related to desirable homework behaviors (i.e., homework management strategies and the amount of homework completed by students), homework attitude and were negatively related to undesirable homework behaviors (i.e., the frequency of coming to class with homework), being in line with relevant literature on the role of student attitudes in the homework process (e.g., [8,44,54]).

Future research on the HPS could benefit from focusing on the following three areas. Although the present study revealed that the HPS was positively related to homework management strategies, homework attitude and the amount of homework completed by students, and negatively related to the frequency of coming to class without homework based on self-reported data, there is a need to include other measures of homework behaviors (e.g., as recorded by teachers) and academic achievement to complement students' self-reports.

In addition, there is a need to examine the validity of scores on the HPS with elementary, middle and high school students in Turkey. Furthermore, additional research (e.g., with the use of CFA in the framework of structural equation modeling) is needed to determine its applicability to different school level. Finally, practitioners and users of the HPS should be aware that this instrument, like many others used in the education arena is based on self report data.

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