

## ASSESSING THE OVERALL PERCEIVED QUALITY OF THE UNDERGRADUATE STUDENTS

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### Abstract

**Purpose** - The paper is twofold aimed: (i) defining and validating a scale to assess the quality of the university experienced by students and (ii) analyzing the role of the aforementioned dimensions and their impact on students' satisfaction.

**Methodology/Approach** - A survey of 2,557 undergraduate students that finished their degrees in 2013 at universities located in the region of Catalonia has been analyzed using Structural Equation Modeling (SEM). An exploratory analysis suggests the final dimensions that were confirmed in a confirmatory analysis. The psychometric characteristics of the scale are provided to show reliability and validity of the constructs.

An extra model (also using SEM) assesses the impact of these dimensions on overall satisfaction.

**Findings** - The quality is a multifactor construct composed by: (i) "syllabus", which refers to the quality of the learning methods and the coordination efforts through the whole study period; (ii) "skills development", referring to the skills that students might acquire along their studies and (iii) "services and facilities" of the university.

Moreover, the first and third factors act as "enablers" for the second factor one. Nevertheless, only "Syllabus" dimension affects significantly on students' satisfaction, whereas "services and facilities" do not have a significant role, although they are necessary in order to provide a good service.

**Research Limitation/implication** - Although the sample is large enough to draw robust results, it is limited the Catalonia. The paper provides recommendations for university managers and public administration authorities in order to allocate the available resources.

**Originality/Value of paper** - In an era of global competition, universities are trying to adapt to these new requirements by expanding they academic offer, introducing innovative teaching methods, providing teaching resources to lecturers, and updating the general services of the university among others. All these services will be considered when students evaluate their experience at the university. The paper contributes with an assessment scale for the holistic service provided by the university within the period that the student is in the university. These

findings can be applied to help define attractive academic programs and provide useful insights on how the supporting facilities should be designed to allow students take advantage of their learning process at universities.

**Keywords** - higher education; perceived service quality; student satisfaction; assessment.

### **Introduction**

Higher Education Institutions (HEI) are expected to excel at three different missions: teaching, research and knowledge transfer. Recent trends, such as the commercial competition imposed by economic forces, have forced universities to focus on the quality of the service as a way to obtain sustainable competitive advantages (Abdullah 2006; Poole et al. 2000; Sohail and Shaikh 2004). This approach highlights the importance of understanding student satisfaction regarding their educational experience (Abdullah 2006). In recent years, the concept of service quality related to satisfaction has stood as a central point for the higher education (HE) system (Abdullah 2006; Oldfield and Baron 2000). University managers want to assure and increase their share in this competitive market; however, to do so, they need to ensure student satisfaction, as they are the active recipients of the service and, therefore, can act as advocates or detractors of their university. Moreover, adopting a wider view, the quality of the university system also creates a reputation for the region or the country. Accordingly, not only university managers but also public authorities are interested in preserving and improving the status of their universities. However, evidence suggests that some reforms that have been introduced in recent years in the HE system have acted as barriers rather than as facilitators (Cheng and Tam 1997), signaling the need for a better understanding of how universities work, and an awareness of the specific nature of the HE system in terms of quality assurance.

Aiming to bring light to this issue, this paper pursues a double objective. First, we define and validate a scale to assess the perceived quality of students once they have completed their university studies. Second, we assess the usefulness of the scale and examine how each of the different dimensions of this scale of university quality contributes to explain student satisfaction. The empirical application considers a survey of 2,557 undergraduate students that finished their degrees in 2013 at universities located in the region of Catalonia (Spain).

The paper is structured as follows. The next section summarizes the current state of assessing university quality in the HE system, followed by the methodology. The results are then presented and discussed. The paper ends with concluding remarks, including the limitations and possible avenues for future research.

### **Theoretical underpinnings**

#### ***Service quality in higher education***

Literature about HEI is rich. Universities have been addressed from many different perspectives; however, little evidence is found when considering HEIs as service industries, and how these institutions ensure and deliver quality to their multiple stakeholders. In this regard, Rowley (1997) advised that, to measure the quality of HEIs, all stakeholder perspectives, from students to the legislators, should be considered.

#### ***Antecedents of student satisfaction in HE***

As mentioned before and according to the second objective of this study – finding how the

perceived quality dimensions affected student satisfaction – it is worth reviewing the literature that has investigated potential antecedent conditions of student satisfaction. For instance, Alves and Raposo (2007) suggested a conceptual model to evaluate student global satisfaction, and found two main influencing factors: the image and the perceived value (consisting of customer expectations, and technical and functional quality perceived). The study also examines the consequences of student satisfaction, with findings revealing that a main implication is student loyalty, manifested in the form of word-of-mouth; in this respect, students become university brand advocates or detractors.

Letcher and Neves (2010) carried out a stepwise regression analysis to determine students' "overall" satisfaction, measured via three dimensions: fulfilling expectations, value of investment, and recommendation of the program. Antecedents included eight different factors: (i) self-confidence, (ii) satisfaction with the curriculum, instruction and classes, (iii) satisfaction with quality of teaching of subject matter, (iv) satisfaction with extracurricular activities and career opportunities, (v) satisfaction with student advising, (vi) quality of teaching and instructor feedback, (vii) satisfaction with computing facilities, and (viii) satisfaction with student quality and interaction. Similarly, in a recent study, Mahmood (2011) analyzed the effect of factors – lecturers, research courses, facilities and supervisor support – on HE quality.

## Methodology

### *Data collection and sampling*

To assess the perceived quality and the student satisfaction in HEIs, the authors signed an agreement with AQU (the Catalan University Quality Assurance Agency) to explore a survey that the AQU had sent to recent graduates of Catalan universities. The AQU is the primary instrument for quality promotion and assurance in the HE system in Catalonia. It is a public body subject to private law under the corresponding government department with jurisdiction over the universities. It is a separate legal entity with full legal capacity to act in terms of its own privileges and liabilities. Set up as a consortium of the Catalan Government and the universities on 29 October 1996, it was the first quality assurance agency in Spain. The AQU is a full member of the ENQA (the European Association for Quality Assurance in Higher Education), and it is registered with the EQAR (the European Quality Assurance Register) and is ISO 9001 certified (AQU 2016). To assess the quality provided by the Catalan HE system, in 2001, the AQU created a survey to be taken by undergraduate students that completed their studies at Catalan universities. The questionnaire was designed by the AQU based on the expertise and practical knowledge gained since its establishment. A number of external experts contributed to defining the instrument.

The questionnaire includes a section to collect 20 items to assess university degree quality. These items were gathered from previous studies performed by the AQU. All items were presented as statements to which respondents indicated their agreement/disagreement on a five-point Likert-type scale (from 1 = strongly disagree to 5 = strongly agree). Table 1 shows the items of the questionnaire related to the service quality perceived. The survey contains two additional sections: a series of questions referring to respondent socio-demographic information, and a final section with only one item aimed at assessing their overall satisfaction – also on a five-point Likert scale.

Table 1. Items and codes of the questionnaire to assess perceived quality.

UnQu1	The structure of the syllabus has allowed a proper progression of my learning
UnQu2	There has been good coordination in the content of the subjects to avoid overlap
UnQu3	The volume of work has been consistent with the required number of ECTS of the subjects
UnQu4	I am satisfied with lecturers
UnQu5	The teaching methodology used by lecturers has helped my learning process
UnQu6	The mentoring and personalized attention has been useful and has helped me improve my learning process
UnQu7	The online platform (virtual campus) was a suitable environment to generate knowledge and improve my learning
UnQu8	Evaluation systems have properly reflected my learning
UnQu9	The internships have allowed me to consolidate and apply knowledge and skills acquired during the degree
UnQu10	The mobility activities in which I have participated have been relevant for my learning
UnQu11	The bachelor's thesis has allowed me to assess my level of achievement of competencies
UnQu12	Facilities (classrooms and teaching areas) have been adapted to facilitate my learning
UnQu13	The resources provided by the library services and teaching support have responded to my needs
UnQu14	The student support services (information, registration, academic procedures, scholarships, orientation, etc.) have offered me good advice and care
UnQu15	I have received adequate response to my complaints and suggestions
UnQu16	The information on the website is complete and updated
UnQu17	The training received has allowed me to improve my communication skills
UnQu18	The training received has allowed me to improve my personal skills (confidence level, independent learning, making decisions, solving new problems, critical analysis, etc.)
UnQu19	The training received has allowed me to improve my leadership and teamwork skills
UnQu20	The training received has allowed me to improve my skills for a future professional career

The Catalan HE system consists of twelve universities, seven of which are public, four private and one of a mixed nature. Catalan universities offer about 1,300 university program degrees, including bachelor programs, masters and doctorates, with 26,300 lecturing staff members and more than 237,000 students (AQU 2016). For the purpose of this study, we considered a survey launched in October of 2013 to all graduates of the Catalan HE system in the academic year of 2012/13, and 2,557 questionnaires were collected. Table 2 shows the demographic characteristics of the sample.

Table 2. Demographic characteristics of the sample (student graduates in 2012/2013).

	Number	%
<b>Sex</b>		
No answer	23	.9
Female	1,594	62.3
Male	940	36.8
Total	2,557	100.0
<b>Age</b>		
No answer	19	.7
Less than 21 years old	2	.1
Between 21 and 24 years old	1,710	66.9
Between 25 and 30 years old	545	21.3
More than de 30 years old	281	11.0
Total	2,557	100.0
<b>Location of high school studies</b>		
No answer	18	.7
Does not apply	37	1.4
Catalonia	2,301	90.0
Rest of Spain	145	5.7
Europe Union	23	.9
Rest of the world	33	1.3
Total	2,557	100.0
<b>Access to the University</b>		
No answer	21	.8
From official exam	1,873	73.2
From a professional cycle	328	12.8
From other degree	170	6.6
From the same degree in other university	27	1.1
From previous low-degree	53	2.1
From special examination for people older than 25 years	62	2.4
Others	23	.9
Total	2,557	100.0

### ***Method***

A two-stage analysis was proposed. In the first stage, we validated the UnivQual scale. To do this, we used a principal component analysis to explore the natural dimensions among the 20 items of “perceived quality” included in the questionnaire. This exploratory factor analysis (EFA) yielded three dimensions. Consequently, the dimensionality of each of these dimensions was the next step performed. Once the dimensions were clearly identified and characterized, we proceeded to assess their reliability and determine the internal consistency and divergent validity. Once all of the dimensions displayed correct psychometric properties, a confirmatory factor analysis (CFA) was performed, obtaining the validated UnivQual scale.

In the second stage, we examined the explanatory power of the different dimension of the UnivQual scale to explain student satisfaction, that is, how the perceived quality of the service delivered impacts on student satisfaction. For this purpose, a new model was tested where the dependent variable was the item “student satisfaction”, regressed by the three factors of perceived quality of the UnivQual scale. The mediation effect of the perceived quality between expectations and satisfaction was also assessed. This last step was necessary to provide the nomological validity of the scale, as it provided new insights into the antecedents of student satisfaction.

### **Results**

#### ***Exploratory analysis of the UnivQual scale***

A Principal Components Analysis of the 20 items of perceived quality was performed. Both the Kaiser-Meier-Olkin statistic (0.937) and the Barlett test ( $\chi^2 = 7,174.6$ ; 190 degrees of freedom; p-value = 0.000) forecasted a good result for this analysis. These results confirmed a linear dependence between the variables and supported our view that the results were sound (Hair et al. 2010). Four factors emerged with eigenvalues greater than one (Kaiser criterion), which accounted for 60.04% of the variance in the sample. However, the last eigenvalue was slightly on the threshold (1,036) and it was dropped in order to simplify the analysis. Thereafter, a new exploratory analysis was performed, forcing it to extract three factors that accounted for the 54.86% of the variance. Table 3 shows the suggested factors, including the percentage of variance extracted. Only loads above 0.250 are shown. The criteria to retain items were: (i) loaded at 0.50 or more on a factor and (ii) did not load at more than 0.50 on two factors.

Table 3. Matrix of the three components extracted using the principal component analysis and the varimax rotation of the UniQual items.

	1	2	3
UnQu5	.707	.313	
UnQu8	.686	.275	
UnQu3	.673		
UnQu2	.664		
UnQu4	.646	.295	
UnQu1	.617	.318	
UnQu6	.531		.276
UnQu11	.413		.263
UnQu19	.325	.812	
UnQu18	.312	.798	
UnQu20	.326	.749	
UnQu17	.289	.747	.262
UnQu9		.489	.458
UnQu14	.352		.715
UnQu16	.286	.302	.643
UnQu13	.309		.618
UnQu15	.456		.618
UnQu12	.389		.541
UnQu10		.346	.522
UnQu7	.299	.339	.411
Percentage of variance extracted	1.64%	7.39%	5.83%

The first factor refers to how the educational program (the bachelor’s or master’s degree) is designed and implemented (Letcher and Neves 2010; Tsinidou et al. 2010). In this factor, items relate to the general structure of the program, the coordination of contents among subjects, the equilibrium and balance of different subjects, the evaluation and assessment systems, the teaching methods, and the workload required by the different subjects that take part in the study plan. It also considers the overall satisfaction with regard to lecturers’ activities (teaching duties and availability during office hours) and their role as student mentors.

The second factor gathers items that account for the impact of the training on the student. That is, how students assimilate the knowledge transmitted and in which level they acquire the skills developed throughout the academic program. Said differently, this construct mirrors how the academic program enables students to develop not only technical skills – those specific for the discipline – but also soft skills – such as communication, teamwork, critical thinking, decision-making, or leadership.

Lastly, the third factor includes six items that collect information about the general services, facilities and equipment of the university (Letcher and Neves 2010; Tariq 2011; Tsinidou et al. 2010). Particularly, it refers to a wide variety of “services and facilities”, such as the library,

classrooms, other teaching equipment, support for mobility programs, websites (usefulness of the information provided, timely updates), information regarding the enrollment process, grants and scholarships, etc. Overall, this factor is therefore, an assessment of the services deployed and conveyed by the university.

***Validating the UnivQual scale***

To examine the unidimensionality of the aforementioned constructs, we ran three CFAs – one for each of the constructs – using EQS 6.2 software. The three analyses extracted only one factor, indicating that our approach was sound. The internal reliability of these factors was then assessed and confirmed as the retained indicators exhibited loadings of .70 or higher. All items were statistically significant except UnQu2, UnQu3 and UnQu6 in the first factor and UnQu10 in the third. As the loadings of these items were close to 0.7 and their content was meaningful for the construct they represented, we decided to include them also in our scale. Future research might consider refining these items to improve their fit.

The internal consistency of the constructs reaffirmed our approach, obtaining values that exceeded the recommended threshold value of 0.7 for both the Cronbach’s alpha coefficient and composite reliability (CR). The average variance extracted (AVE) also surpassed the cut-off point of 0.5 (Nunnally and Bernstein 1994) for all factors except the first (curriculum), although the result were close. To corroborate further the suitability of the items included in the first factor, we conducted several tests removing the items with a lower load. Results revealed that the Cronbach’s alpha value did not improve; therefore, we decided not to exclude any items. Table 4 summarizes the reliability analysis of the three dimensions of perceived quality.

Table 4. Loads of the three CFAs and statistics for their reliability analyses.

	Syllabus	Skills development	Services and facilities
	UnQu1 0.744	UnQu17 0.844	UnQu10 0.442
	UnQu2 0.646	UnQu18 0.888	UnQu12 0.706
	UnQu3 0.623	UnQu19 0.873	UnQu13 0.710
	UnQu4 0.737	UnQu20 0.810	UnQu14 0.800
	UnQu5 0.811		UnQu15 0.790
	UnQu6 0.622		UnQu16 0.748
	UnQu8 0.723		
Cronbach’s alpha	0.821	0.876	0.787
Range of Cronbach’s alpha if one item is removed	0.778–0.815	0.821–0.865	0.730–0.814
Range of correlations between items and total corrected scale	0.483–0.691	0.672–0.785	0.314–0.636
Composite reliability	0.872	0.915	0.855
Average variance extracted	0.496	0.730	0.504

All loads significant at p-value = 0.01

Table 5 provides the results for the analysis of discriminant validity, which was performed using linear correlations or standardized covariances between latent factors by examining whether the inter-factor correlations were less than the square root of the AVE (Fornell and Larcker 1981).

As seen in Table 5, the square roots of each AVE were greater than the off-diagonal elements. Thus, discriminant validity was confirmed.

Table 5. Correlation matrix of latent factors.

	1	2	3
1 Syllabus	<i>0.704</i>		
2 Skill development	0.587	<i>0.854</i>	
3 Services and facilities	0.674	0.562	<i>0.710</i>

All correlations are significant at the 0.01 level (bilateral)

Diagonal elements are the square roots of the average extracted

In our final scale, the correlations between each item and the total corrected scales were high enough to denote a correctness of fit, and convergent validity was confirmed for all factors, obtaining statistically significant loads ( $t > 2.58$ ).

In the next step, we scrutinized the dimensions of UnivQual as dimensions of a CFA. The model was estimated using the robust maximum likelihood method from the asymptotic variance-covariance matrix. The fit indices obtained in the measurement model estimation showed that the variables converged toward the factors established in the CFA (see Table 6).  $\chi^2$  Satorra-Bentler was 489.15, with 116 degrees of freedom and a p-value of 0.000.  $\chi^2/df$  was 4.22, which was below the acceptable limit of 5, RMSEA was 0.063 and the CFI was 0.931. Taking the significance of the robust  $\chi^2$  statistic with caution and noting the global indicators, the global fit was acceptable (Hair et al. 2010).

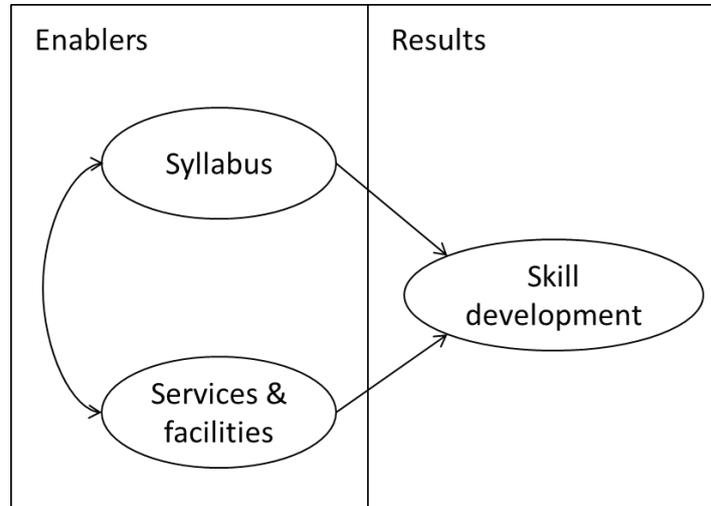
Table 6. Confirmatory factor analysis of UniQual.

Dimension	Items	Load	t-value	r <sup>2</sup>
Syllabus	UnQu1	0.689	-	0.474
	UnQu2	0.565	17.350	0.319
	UnQu3	0.577	16.596	0.333
	UnQu4	0.721	18.962	0.520
	UnQu5	0.808	22.327	0.653
	UnQu6	0.619	17.681	0.383
	UnQu8	0.717	20.416	0.513
Skill development	UnQu17	0.820	-	0.672
	UnQu18	0.877	28.107	0.796
	UnQu19	0.839	26.435	0.704
	UnQu20	0.795	23.161	0.633
Services and facilities	UnQu10	0.372	-	0.138
	UnQu12	0.620	9.501	0.384
	UnQu13	0.631	8.842	0.398
	UnQu14	0.754	9.283	0.568
	UnQu15	0.767	9.259	0.588
	UnQu16	0.707	9.442	0.500
Goodness of fit summary				
Satorra-Bentler scaled $\chi^2$		489.15		
Degrees of freedom		116		
p-value		0.000		
$\chi^2/df$		4.22		
Comparative fit index (CFI)		0.931		
Root mean-square error of approximation (RMSEA)		0.063		
90% confidence interval of RMSEA		(0.057, 0.068)		

Based on this analysis, we can confirm that there are three main factors that capture student perceptions of service quality at HEIs: (i) curriculum, (ii) skill development, and (iii) services and facilities.

In the light of these factors, the first and third items act as “enablers” for the second factor. Following the EFQM’s notation, this second factor can be interpreted as the “results” of the process. Consequently, we posit that our scale as in Model 1 has two “enablers” – curriculum, and services and facilities – that explain a “result” – skill development. Figure 1 graphically illustrates this logic.

Figure 1. Model 1, where enablers “Syllabus” and “Service and facilities” explain “Skill development”.

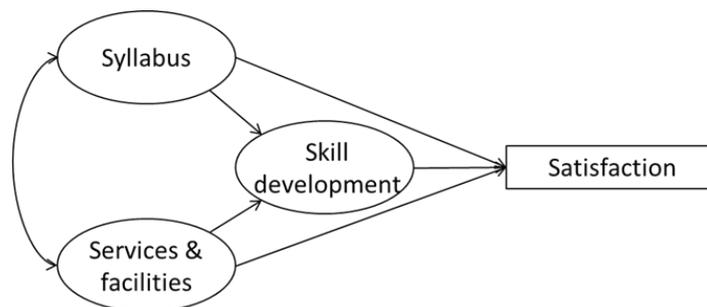


***Perceived quality dimensions as antecedents of student satisfaction***

Given the data on how students evaluated their whole experience at the university, a new model (Model 2) was proposed. With this model, we aimed to evaluate how each of the three dimensions in the UnivQual scale affected student satisfaction. Figure 2 shows that, in this case, we consider three “enablers” – curriculum, skill development, and services and facilities – as antecedents of student satisfaction. The fit indices obtained in this measurement model estimation were satisfactory:  $\chi^2$  Satorra-Bentler was 579.96, with 130 degrees of freedom and a p-value of 0.000; therefore,  $\chi^2/df$  was 4.45. RMSEA (0.065) and CFI (0.924) also displayed appropriate values.

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Figure 2. Model 2 to assess the perceived quality dimensions as antecedents of satisfaction.



Results in Table 7 show that the most important predictor of satisfaction is “curriculum”. It is particularly important as it has a high and robust direct effect, but also an indirect effect through “skill development”. On the contrary, “services and facilities” does not seem to play a role in student satisfaction.

Table 7. Results of model 2, where the quality perceived dimensions are antecedents of satisfaction.

	Standardized coefficient	t-value
(F1 Syllabus) → (F2 Skill development)	0.531	8.486
(F3 Services & Facilities) → (F2 Skill development)	0.222	3.311
(F2 Skill development) → Satisfaction	0.343	7.166
(F1 Syllabus) → Satisfaction	0.547	8.348
(F3 Services & Facilities) → Satisfaction	-0.053	-0.978
	Covariance	t-value
(F1 Syllabus) - (F3 Services & Facilities)	0.456	12.228

### Concluding remarks

Two are the main contributions of this study. First, we have designed and validated a scale, UnivQual, to assess holistically student perceptions of the service quality delivered at universities. This scale presents the distinctive feature of being a useful instrument for assessing not just an individual subject or course, but for capturing student perceptions after completing their studies. Accordingly, it contains a number of items that refer to the entire academic program. Second, we test the explanatory power of the different dimensions of the UnivQual scale to predict student satisfaction.

There are several conclusions that can be drawn from the analysis. The first finding is that the quality of an academic program is a multifactor construct. We propose a scale of 17 items arranged in three dimensions: curriculum, skill development, and services and facilities. An in-depth analysis of the aforementioned three dimensions suggests considering two of these factors as “enablers” – curriculum, and services and facilities – for the “result” of the service provided –skill development. How the “curriculum” is designed and implemented strongly affects how students improve their skills (both soft and hard); however, the “services and facilities” play a second-order role, acting as an enabler of the learning process. Nevertheless, both factors are necessary and mutually reinforce each other.

In the second stage analysis, we provide evidence that student satisfaction is mainly explained by the content of the program and the learning process. To a lower extent, it also depends on the skills acquired by students after the years they spent at the university. On the contrary, the perceived quality of the services and facilities only has an indirect and marginal effect. Overall, these results suggest that one of the main actors responsible for improving student satisfaction is the faculty. Because students are one of the most important active recipients of university services, their voice should be heard. These conclusions may provide insights for managers when defining the global strategy of universities. Public and local authorities also have in their hands the shared responsibility in that they are in charge of allocating the public resources.

We believe this paper provides an original contribution to the existing literature on assessing quality at universities from the student perspective. We hope our findings can be applied to help define attractive academic programs and provide useful insights on how the supporting facilities should be designed to allow students take advantage of their learning process at universities. Future research (both qualitative and quantitative) will also benefit public authorities in charge of allocating the resources.

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