

Development and validation of a questionnaire about determinants of academic success in secondary school students

Desarrollo y validación del cuestionario sobre condicionantes de éxito escolar en alumnos de secundaria

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Abstract:

Introduction: School failure is a major challenge at individual and social levels, owing to its negative impact on social cohesion, citizen participation, economic development, and sustainability and also its impact on health habits. Various studies have shown the link between family socio-economic level and educational results, to the point that this factor has been regarded as their principal determinant. Nonetheless, the essentially attributing school failure to the students' milieu is only descriptive in value and could impede the development of more appropriate responses to this challenge. A better systemic and integral understanding of the phenomenon might contribute to a better approach to the problem through the development of new proposals for public policy and socio-educational actions. To this end, it is necessary to have appropriate measurement instruments that evaluate different dimen-

sions in an integrated manner. **Method:** The objective of this study is to evaluate the psychometric properties of the Questionnaire on Determinants of Success at School (QDSS) in a sample of 858 secondary-school students resident in vulnerable socio-demographic settings from 5 Spanish cities. The questionnaire combines items about factors that specialist literature has significantly linked to educational attainment, excluding those that already have specific validated questionnaires. **Results:** The principal component analysis gave 7 factors: school environment, relationships with classmates, personal expectations, social capital, ITC study resources, climate in class, and family support. The goodness of fit indices show good properties for the questionnaire. **Conclusion:** The QDSS is an instrument that has appropriate psychometric properties for use in identifying factors that support educational success in secondary-school students.

Revision accepted: 2017-07-19.

This is the English version of an article originally printed in Spanish in issue 269 of the *revista española de pedagogía*. For this reason, the abbreviation EV has been added to the page numbers. Please, cite this article as follows: Longás Mayayo, J., Carrillo Álvarez, E., Fornieles Deu, A., & Riera i Romani, J. (2018). Desarrollo y validación del cuestionario sobre condicionantes de éxito escolar en alumnos de secundaria | *Development and validation of a questionnaire about determinants of academic success in secondary school students*. *Revista Española de Pedagogía*, 76 (269), 55-82. doi: 10.22550/REP76-1-2018-03 <https://revistadepedagogia.org/>

ISSN: 0034-9461 (Print), 2174-0909 (Online)

year LXXVI, n. 269, January-April 2018, 55-82
revista española de pedagogía



55 EV

Keywords: success at school, school failure, secondary education, poverty, validation, questionnaire.

Resumen:

Introducción: El fracaso escolar supone un gran desafío tanto a nivel individual como a nivel social, por su impacto negativo en la cohesión social, la participación ciudadana, el desarrollo económico, la sostenibilidad e incluso su incidencia sobre los hábitos de salud. Diversos estudios han puesto de manifiesto la asociación entre el nivel socioeconómico familiar y los resultados escolares, hasta el punto que dicho factor se ha considerado su principal determinante. No obstante, el hecho de atribuir el fracaso escolar esencialmente al contexto de pertenencia sólo tiene valor descriptivo y podría estar dificultando el desarrollo de respuestas más adecuadas a este gran desafío. Una mejor comprensión sistémica e integral del fenómeno podría contribuir a un mejor abordaje de la problemática mediante el desarrollo de nuevas propuestas de política pública y de acción socioeducativa. Para ello, es necesario disponer de los instrumentos de medida adecuados que evalúen diferentes di-

mensiones de una manera integrada. **Método:** El objetivo del presente estudio es evaluar las propiedades psicométricas del Cuestionario sobre Condicionantes de Éxito Escolar (CCEE) en una muestra de 858 alumnos de secundaria residentes en contextos socio-demográficos vulnerables de 5 ciudades españolas. El cuestionario recoge ítems sobre aquellos factores que la literatura especializada ha vinculado de manera relevante con el rendimiento escolar, excluyendo aquellos que ya disponen de cuestionarios específicos validados. **Resultados:** El análisis de componentes principales dio lugar a 7 factores: contexto escolar, relaciones con los compañeros, expectativas personales, capital social, recursos TIC para el estudio, clima en clase y apoyo familiar. Los índices de ajuste muestran unas buenas propiedades del cuestionario. **Conclusión:** Se concluye que el CCEE es un instrumento que posee propiedades psicométricas adecuadas para su uso en la identificación de factores que apoyan el éxito educativo en alumnos de secundaria.

Descriptor: éxito escolar; fracaso escolar, educación secundaria, pobreza, validación, cuestionario.

1. Introduction

This study is part of a research project that proposes a complex and systematic approach to the phenomenon of school success/failure in Spain and examines the importance of the factors that support educational resilience in students living in vulnerable sociodemographic settings.

School failure, as opposed to success at school, is in itself an imprecise and ambig-

uous concept (Marchesi and Hernández, 2003). It normally refers to the proportion of individuals who do not complete compulsory studies (Calero, Chois and Waisgrais, 2010; Escudero and Martínez, 2012) although it is also sometimes used to refer to people who fail in post-compulsory secondary education, a definition that would more closely correspond with the notion of early school leaving (Mena, Fernández-Enguita and Riviere, 2010).

The term early school leaving refers to failure to attain level 3 on the International Standard Classification of Education (ISCE), which in Spain corresponds to completing post-compulsory secondary education (baccalaureate or professional training). According to figures from Eurostat (2015), the early school leaving rate among people aged between 18 and 24 in Spain is 21.9%, almost twice the EU average and one of the worst rates among European Union members.

Being unable to prove you have the minimum competences valued and required in society causes great problems with labour integration, thus putting people from Spain who are in this situation at a greater risk of social exclusion and vulnerability resulting from poverty (Boada, Herrera, Mas, Miñarro, Olivella, and Riudor, 2011; Gil-Flores, 2011; Jolonch, 2008; Sarasa and Sales, 2009). Recent data show that people with low levels of qualifications, without education, or who have only completed primary education have unemployment rates of around 48.9% and 35.2% respectively, figures that fall as levels of studies increases (INE, 2015a and 2015b).

So, school failure, in any of its definitions, is a major challenge at individual and social levels owing to its negative impact on social cohesion, citizen participation, economic development, sustainability, and even on the development of healthy lifestyle habits and public health matters (Belfield, 2008; Brunello and Da Paola, 2013; WHO, 2013). So much so, that the European Union, in its Europe 2020 strategy commits to reducing early school leaving to under 10% in 2016 (Eu-

ropean Commission, 2010, 2011). Nonetheless, reaching this milestone is difficult and requires an in-depth understanding of the phenomenon of school failure and its underlying causes (Brunello and Da Paola, 2013).

In this context, various studies have made clear the association between family socioeconomic level and educational attainment (Bravo and Verdugo, 2007; Cordero, Crespo and Santín, 2010; Choi and Calero, 2013; Renée and McAlister, 2011), to the extent that this factor is considered to be its main determinant (Goldthorpe, 2000; Fernández-Enguita, Mena, and Riviere, 2010; Ferrer and Albaigés, 2008). However, correlation does not imply causation and lack of qualifications or early school leaving might be caused by the convergence of very diverse circumstances. In effect, attributing school failure to the students' milieu is only descriptive and, in our view, could hinder the development of more appropriate responses to this great challenge (Smith, 2003). Accordingly, a greater effort to achieve a systemic and integral understanding of the phenomenon could contribute to a better approach to the problem though the development of new proposals for public policy and socio-educational activities (Civís and Longás, 2015; Longás, Cussó, Querol, and Riera, 2016).

One of the main difficulties in advancing in this direction is the lack of sufficiently thorough and methodologically appropriate studies for obtaining data, as while there are pieces of research that specifically gather empirical evidence about the influence of individual (Berlin-

er, 2009), family (Hernando, Oliva, and Pertegal, 2012; Jeynes, 2007), school (Flecha, 2002 and 2009), and community factors (Hatcher and Leblond, 2001) on failure and success at school, we were unable to identify any quantitative research that combines all of these dimensions.

Starting with a review of recent literature performed as part of this research project (Díaz-Gibson et al., 2017) and the first results obtained based on analysis of life stories of students who are vulnerable and have a record of success at school (Longás et al., 2016), the principal determinants of failure and success at school are summarised below.

In the individual sphere, it is clear that the intellectual capacities of each student relate to their success at school. However, a number of social, economic, and cultural determinants from the family and school settings have a direct impact on the educability of children and adolescents, thus limiting the weight of intelligence as an explanatory factor for success (Bonal, Tarabini, Constans, Kliczkowski, and Valiente, 2010). This makes it possible to understand that the bulk of the literature about PISA (Calero et al., 2010; Cordero et al. 2010; Choi and Calero, 2013; Sánchez and García-Rodicio, 2006 among others) identifies as the most decisive variables of success at school: a) the family's socio-economic level; b) coming from minority cultures and immigrant families; c) a high concentration (>20%) of students of immigrant origin in schools.

Other more focused studies allow us to expand the range of factors that are determinants of success at school for each

individual, also determined by family relationships. The following factors and variables stand out:

a) Psycho-affective (self-esteem, perception of family support, positive family expectations, personal motivations) (Carpenter et al., 2010; Longás et al., 2016; Núñez et al., 2013; Renée and McAlister, 2011; Roman, Cuestas, and Fenollar, 2008; Santana and Feliciano, 2011).

b) Personality, principally the development of responsibility and capacity for effort (Torres-Acosta, Rodríguez-Gómez and Acosta-Vargas, 2013) and social competency linked to school socialisation and the development of social capital (Maccoby and Martin, 2006); biological ones, like a low birth weight or poor health conditions (Berliner, 2009); and material factors such as access to sufficient cultural and technological resources (OCDE, 2013). Deficiencies in these variables (García Alegre, 2014) are more frequent in situations of poverty because the situation of vulnerability also shapes the family's educational environment, the parents' engagement in education, their relationship with the school and access to resources (Collet and Tort, 2011; Fernández-Enguita et al., 2010; Jeynes, 2007).

Among the variables corresponding to the school environment, educational and organisational actions intended to improve educational success stand out, including strategies for responding to diversity, early preventive intervention, encouraging cooperation between teachers and promoting the school-family relationship (Depalma, Matusov, and

Smith, 2009; Murillo and Roman, 2011; Pozo, Suárez, and García-Cano, 2012; Rodríguez, Ríos, and Racionero, 2012). Recent studies also show the importance of teaching quality, which includes teaching competencies, pastoral care, and the capacity to generate a bond and positive expectations (Hanushek and Woessmann, 2010; Rivkin et al., 2005). Some pieces of research give special value to the bond or the students' sense of belonging to the school (Archambault, Janosz, Morizot, and Pagani, 2009; Geddes, 2010; Marcus and Sanders-Reio, 2001). This bond that favours success could be the result of integration into the peer group and the positive climate —of coexistence and work— in the classroom and the school that the PISA model explores, alongside the perception of support from teachers (Roorda, Koomen, Spilt, and Oort, 2011; Santana and Feliciano, 2011) and the construction from school experience of expectations of success in relation to education and study (Pàmies, 2013). Studies based on PISA give school resources little significance (Calero and Escardíbul, 2007).

In turn, having a rich socio-educational framework or community social capital, something that is impossible if there is no collaboration between educational and social bodies in the community, favours educational success, especially in settings of low socio-economic level (Bravo and Verdugo, 2007; Moliner, 2008; Pedró, 2012; Pozo, Suárez, and García-Cano, 2012) thanks to its impact on the construction of scenarios of opportunity for learning and social development (Miller, 2016).

Having completed our review, we identified the need for an instrument to sys-

tematise and unify data collection on factors relating to success at school to be able to relate them empirically and enable a more holistic analysis. There are specific validated and highly recognised questionnaires that provide reliable information about some of the determinants of success identified in the literature. In the framework of our research, we consider that the following are relevant:

a) The Hollingshead Four-Factor Index of Socioeconomic Status (SES) to determine the socio-economic level (Canals, 2002; Hollingshead, 1975).

b) The European scale of household material deprivation (Guio and Marlier, 2013) for identifying situations of vulnerability.

c) NEO-FFI to evaluate the responsible personality (Costa and McCrae, 2008).

d) VISA-TEEN (Costa-Tutusaus and Guerra-Balic, 2016) to evaluate healthy habits and state of health. In order to provide a specific instrument that integrates the other relevant factors in the literature to complement those mentioned above, this study aims to construct and validate a questionnaire intended for secondary-school students that enables an integrated evaluation of determinants of success at school based on their perceptions.

2. Method

2.1. Sample

The sample for this study was chosen using convenience sampling and comprised 858 students from year 4 of ESO

(compulsory secondary education) and year one of Baccalaureate (2014-2015) at 29 schools in the following cities and their metropolitan areas: Barcelona (32.2%), Seville (13.8%), Murcia (22.6%), Tenerife (19.3%), and Palma de Mallorca (12.1%). Of these, 50.2% were male and 49.4% female, 81.5% of them were in year 4 of ESO in the 2014-15 academic year and the remaining 18.5% were studying towards the baccalaureate. Of the participants, 67.8% were born in 1999, 20.7% in 1998, 9.9% in 1997 and 1.5% between 1992 and 1996.

The average grades for the previous academic year, provided by each school, indicated that 4% had obtained a fail grade, 27.4% a pass, 32.5% good, 24.8% very good, and 11.3% excellent. Of the schools in the sample, 17% (5) are in medium or medium-high level socio-economic settings, while the others are located in settings of low socio-economic levels comprising demographics with average income and unemployment. Table 1 shows the frequencies and percentages of the main demographic variables of the sample.

TABLE 1. Characteristics of the sample.

Variables	N	%
TOTAL	858	100
City		
Barcelona	276	32.2
Seville	194	22.6
Murcia	104	12.1
Palma de Mallorca	166	19.3
Santa Cruz de Tenerife	118	13.8
Year of birth		
1992-1996	13	1.5
1997	84	9.9
1998	175	20.7
1999	574	67.8
No data	12	1.4
Gender		
Male	431	50.2
Female	424	49.4
No data	3	0.3
Place of birth		
Spain	715	83.3
Outside Spain	138	16.1
No data	5	0.6
Years in the city		
>15	434	50.6
11-15	267	31.1
6-10	76	9.0
0-5	70	8.3
No data	11	1.3

Variables	N	%
TOTAL	858	100
Current year		
Y4 ESO	699	81.5
Y1-2 Baccalaureate	156	18.5
Average grade		
Excellent	34	11.3
Very good	235	24.8
Good	279	32.5
Pass	213	27.4
Fail	97	4.0
Father's level of studies		
No education	66	7
Primary education completed	237	25.1
Baccalaureate or CFGS incomplete	119	12.6
Baccalaureate or CFGS completed	178	18.8
University studies incomplete	56	5.9
University studies 1st cycle	69	7.3
University studies 2nd cycle	131	13.9
No data	89	9.4
Mother's level of studies		
No education	59	6.2
Primary education completed	240	25.4
Baccalaureate or CFGS incomplete	127	13.4
Baccalaureate or CFGS completed	181	19.2
University studies incomplete	74	7.8
University studies 1st cycle	83	8.8
University studies 2nd cycle	121	12.8
No data	60	6.3

Variables	N	%
TOTAL	858	100
Father's employment status		
Working	700	74.1
Unemployed	115	12.2
Retired	52	5.4
No data	78	8.3

Variables	N	%
TOTAL	858	100
Mother's employment status		
Working	624	66
Unemployed	237	25.2
Retired	24	2.7
No data	58	6.1

Source: Own elaboration.

2.2. Instrument

The Questionnaire on Determinants of Success at School (QDSS) combines items concerning factors for which the specialist literature has identified a significant link to educational attainment, excluding those that already have specific validated questionnaires. Consequently, in addition to socio-demographic variables, the questionnaire we initially designed, attempted to evaluate the following determinants of success at school (Table 2): personal expectations of suc-

cess; inclusion (students' bond or sense of belonging) in the school; relationship of trust with classmates; student-teacher relationship of trust; teaching model on which the learning process is based; class/peer group climate; family support; social capital; and access to study resources. All items are answered on a five-point Likert scale reflecting how much the respondents agree with each statement (A: strongly agree/phrase totally true, value 5; E: strongly disagree/phrase completely false, value 1).

TABLE 2. List of factors and items from the initial questionnaire.

Factor (*)	Items
Personal expectations	Q13 (University studies), Q14 (Professional training), Q15 (Not continuing studies), Q16 (Future with studies), Q17 (Money without education), Q18 (Motivation to study), Q19 (Social mobility), Q20 (Interest in learning), Q21 (Improving society), Q22 (Obliged to study), Q23 (No alternative to studying), Q24 (No reasons for studying), Q25 (Waste of time), Q26 (Unable to continue studying), Q27 (Not disappointing family).
Inclusion in the school	Q28 (Learning school), Q29 (Useful preparation), Q30 (Desire to go to class), Q31 (Effort in class), Q32 (Interested in class work), Q33 (Uninteresting subjects), Q34 (Challenge), Q35 (Feeling of belonging at school), Q36 (Feels valued at school), Q37 (Treated well by school), Q38 (Participation at school), Q39 (Isolated at school), Q40 (Satisfied w. school).
Relationship with classmates	Q41 (Make friends easily), Q42 (Bullying), Q43 (Good relationship with classmates), Q44 (Respected by classmates), Q45 (Classmates help each other learn), Q46 (Team work), Q47 (Conflict resolution), Q48 (Help from classmates).

Factor (*)	Items
Student-teacher trust	Q49 (Value teachers' advice), Q50 (Teachers are concerned about me), Q51 (Discuss problems w. teachers), Q52 (Teachers get angry), Q53 (Teachers are fair), Q54 (Teachers listen), Q55 (Feel comfortable with teachers), Q56 (Teachers use unfair punishments), Q57 (Teachers keep promises), Q58 (Teachers respect me), Q59 (Feels valued by teachers), Q60 (Speak openly with teachers), Q61 (High expectations from teachers).
Teaching and learning model	Q62 (Teachers do not help), Q63 (Teachers help), Q64 (Teachers pay attention to me), Q65 (No advice from teachers), Q66 (Teachers give explanations), Q67 (High expectations of group), Q68 (Capacity for reflection).
Climate in class	Q69 (No attention in class), Q70 (Noise in class), Q71 (Class environment), Q72 (Start of class), Q73 (Attending class), Q74 (Attention in class), Q75 (Homework), Q76 (Effort by classmates).
Family support	Q77 (Family-teacher communication), Q78 (Family engagement with school), Q79 (Family supports studies), Q80 (Family encourages studies), Q81 (Family help with homework), Q82 (Family monitors schoolwork), Q83 (Family evaluates studies), Q84 (Family pride), Q85 (Family-student communication).
Social capital	Q86 (Support from role model), Q87 (Neighbourhood participation), Q88 (Integration in neighbourhood), Q89 (No role models), Q90 (Value extra-curricular activities), Q91 (School social network), Q92 (Neighbourhood social network), Q137 (Extracurricular activities), Q138 (Volunteering).
Study resources	Q132 (Computer at home), Q133 (Own computer), Q134 (Internet), Q135 (Study space), Q136 (Books).

(*) The items on sociodemographic data are not included (Table 1).

Source: Own elaboration.

The final questionnaire is the result of four stages: (1) a literature review performed by the research team and triangulated with information obtained in interviews with experts to identify the aspects to consider and existing validated instruments that measure these aspects; (2) preparation of the first version of the questionnaire, (3) a pilot application with 47 students to validate the morphosyntactic suitability of the items and how well it meets the initial construct, and (4) psychometric validation of the instrument, which is what we report on in this article.

2.3. Psychometric validation procedure

The study was carried out by applying a cross-sectional survey design. This type of design makes it possible to describe a population at a given moment. It also makes it possible to establish relationships between variables and differences between the different segments that make up the population (León and Montero, 2015).

The questionnaire was distributed in the 29 participating centres. A member of the research team travelled to them

to be present while it was being answered. A participation agreement was signed in advance which established the commitment to return the results from each school. All students who were present when the study was carried out and whose parents and/or legal guardians had authorised their participation with a passive informed consent document took part in the study.

2.4. Data analysis

The following analyses were performed with the objective of verifying the psychometric properties of the questionnaire:

a) Analysis of the items, based on the difficulty indices and the item-total correlation.

b) With the objective of reviewing the dimensionality of the questionnaire, a Principal Component Analysis (PCA) was performed with an Oblimin rotation as the factors were partially correlated (see Table 5) as the situation of orthogonality that would make it advisable to use other standard rotations such as, for example, Varimax cannot be assumed (Thompson, 2004; Izquierdo, Olea, and Abad, 2014). With the 88 original items, various factorial solutions were tried and the one was selected that best met the criteria for factorial adequacy (factorial weight greater than .30 and explained variance percentage), and provided a high internal consistency, alongside parsimony in its description of the factorial structure, interpretability and theoretical coherence of the results.

c) Analysis of reliability of the factors, based on Cronbach's Alpha coefficients for the factors and the correlation between latent factors.

d) Descriptive analysis of the results from the sample, including a study of the factors, considering the mean and standard deviation, as well as a study of the differences by gender, years living in the city, average grade from the previous academic year, country of birth, and maximum level of studies achieved by the parents. These analyses used Student's t-test or ANOVA with unplanned comparison using the Tukey correction according to the type of variable.

The statistical analyses were performed using the IBM SPSS 23 program.

3. Results

Both the Kaiser-Meyer-Olkin index of sampling adequacy ($KMO = 0.905$) and Bartlett's sphericity test ($\chi^2 = 17891.378$, $p < 0.001$) showed the adequacy of the new factorial structure after performing the PCA through an Oblimin rotation using the normalised scores (Z) for the items. The items were filtered through independent application of three criteria: 1) eliminating items with saturations lower than 0.30; 2) eliminating items whose relevance to a given factor was conflictive at a theoretical level; and 3) eliminating items that reduced the internal consistency of the factor (verifying the improvement in Cronbach's Alpha when the item was eliminated).

Consequently, the following items were eliminated: Q33 (uninteresting subjects),

Q34 (challenge), Q21 (improving society) as they displayed saturations lower than 0.30, item Q88 (integration in neighbourhood) that displayed similar saturations in two factors, and item Q36 (feels valued at school) which showed saturation in the Relationship with Classmates factor and because its content was not theoretically justifiable. Following similar criteria, the following items were also eliminated: Q89 (no role models), Q91 (social network), Q92 (neighbourhood social network), Q14 (professional training), Q16 (future with studies), Q17 (money without education), Q27 (not disappointing family), Q30 (desire to go to class), Q32 (interested in class work), Q35 (feeling of belonging at school), Q37 (treated well by school), Q38 (participation at school), Q40 (satisfied with school), Q47 (conflict resolution), Q52 (teachers get angry), Q135 (space for study). Finally, items Q20 (interest in learning), Q29 (useful preparation), Q31 (effort in class), Q74 (attention in class), and Q75 (homework) had similar loads in two factors, and so were included in the one with greater conceptual coherence.

To choose the number of factors to retain, Kaiser's K1 criterion was rejected (eigenvalues greater than one) as it overestimates the number of factors to retain (Izquierdo, Olea, and Abad, 2014). After considering different criteria for retaining factors, such as parallel analysis (Horn, 1965, Buja and Eyuboglu (1992), the scree test (Cattell, 1966), the significance and theoretical coherence of the factors, and their interpretability, the final version comprised 65 items distributed over seven factors that explain 42.91% of the total variance, with values ranging from 17.94 to 2.91% of the variance explained by each of them. Table 3 shows the factor weights for each item greater than 0.30 and the communalities. This Table shows how the communalities of all of the items exceed the value of .25 except in three cases: Q138 Do you participate as a volunteer in any body or association? ($h^2 = .116$); Q133 Do you have your own computer or tablet (i.e., just for you)? ($h^2 = .211$), and Q19 With my studies I hope to obtain a better job than my parents and family members ($h^2 = .226$).

TABLE 3. Principal component analysis of the typical scores of the 65 items, 7 factor solution and oblimin rotation.

	Component							h^2
	I	II	III	IV	V	VI	VII	
Q13 As a student, my aspiration is to complete university studies.			-.507					.296
Q15 I don't expect to continue studying when I leave school.			.461					.252
Q18 I feel motivated and with strength to continue studying in future.			-.620					.554

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	Component							h^2
	I	II	III	IV	V	VI	VII	
Q19 With my studies I hope to get a better job than my parents and family members.			-.301					.226
Q20 Learning on its own is a good motivation for carrying on studying.			-.397					.418
Q22 I carry on studying because I have to.			.615					.421
Q23 I carry on studying because I don't know what else to do.			.488					.333
Q24 I can't find important reasons to continue studying.			.689					.494
Q25 In my situation, continuing studying seems like a waste of time.			.743					.576
Q26 In my situation, continuing studying seems impossible to me.			.677					.500
Q28 At school I develop important capacities and learn important things.			-.340					.405
Q29 The classes give me useful preparation for what I want to do in life.			-.323					.420
Q31 I try to do my best in class.			-.326					.406
Q39 I feel isolated at school.		-.543						.442
Q41 I make friends easily at school.		.773						.596
Q42 I often feel insulted, threatened, or harassed by my classmates at school.		-.545						.442
Q43 I get on well with most of my classmates at school.		.748						.611
Q44 I feel like most of my classmates at school treat me with respect.		.767						.652
Q45 With my classmates we help each other to learn.		.478						.437
Q46 I am capable of working in a team with my classmates.		.500						.442

	Component							h^2
	I	II	III	IV	V	VI	VII	
Q48 At school I have classmates who help me when I need it.		.593						.460
Q49 When the teachers tell me not to do something, I know they have a good reason for saying it.	.558							.391
Q50 The teachers are concerned about me.	.776							.615
Q51 At school there are teachers I can speak to if I have problems.	.582							.421
Q53 The teachers always try to be fair.	.720							.539
Q54 The teachers are always willing to listen to the students' ideas.	.749							.564
Q55 I feel secure and comfortable with my teachers at this school.	.796							.668
Q56 The teachers punish students without knowing what has happened.	-.478							.323
Q57 My teachers keep the promises they make.	.651							.439
Q58 My teachers treat me with respect.	.693							.558
Q59 My teachers do not value me much in class.	-.478							.378
Q60 In this school, you can talk openly with the teachers.	.717							.542
Q61 My teachers always expect the best of me.	.511							.412
Q62 If I fall behind with the content for the year, I don't get help from my teachers to catch up.	-.471							.307
Q63 My teachers are willing to offer me extra help in relation to the class work if I need it.	.660							.417
Q64 My teachers realise if I have problems understanding something.	.629							.468
Q65 My teachers don't give me specific advice on how to improve my work in class.	-.440							.278

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	Component							h^2
	I	II	III	IV	V	VI	VII	
Q66 If I don't understand something in class, my teachers are willing to explain it to me again in a different way.	.639							.458
Q67 My teachers expect all students to make a lot of effort.	.381							.280
Q68 My teachers want us to develop our capacity for reflection, not just memorise things.	.458							.364
Q69 The students don't listen to what the teacher says.						-.584		.353
Q70 There is noise and disorder in class.						-.670		.558
Q71 The environment in class stops me working well.						-.671		.579
Q72 We don't start working until a long time after the start of the class.						-.606		.479
Q73 My classmates believe that it is important to go to class every day.						-.481		.329
Q74 My classmates believe it is important to pay attention in class.						-.653		.574
Q75 My classmates believe that it is important to do their homework.						-.661		.591
Q76 My classmates make an effort to get good grades.						-.532		.397
Q77 My family maintains smooth communication with my teacher/a.				.483				.395
Q78 My family voluntarily gets involved in activities and projects at school.				.533				.396
Q79 As a student, I do not feel supported by my family.							-.571	.396
Q80 My family encourages me to make an effort at school.							.716	.570
Q81 When I need it, someone from my family helps me with my homework.							.657	.487

	Component							
	I	II	III	IV	V	VI	VII	h^2
Q82 In my family nobody asks about my exams or homework.							-.551	.345
Q84 I feel like my family is proud of me.							.629	.547
Q85 There are people in my family I can talk to when I need it.							.722	.603
Q86 The support of a monitor, educator, trainer, has been very important for me in recent years.				.364				.264
Q87 I take part in social and/or leisure activities in the neighbourhood.				.590				.383
Q90 Activities I do outside of school help me improve as a person.				.469				.322
Q132 How many computers or tablets are there in your house?					.537			.384
Q133 Do you have your own computer or tablet (i.e., just for you)?					-.359			.211
Q134 Do you have internet access at home?					-.422			.246
Q138 Do you participate as a volunteer in any body or association?				-.382				.161
Q137 Do you carry out extracurricular activities during the school year?				-.544				.329
% of variance explained	17.94	5.40	5.175	4.53	3.55	3.40	2.92	

Source: Own elaboration.

Note: h^2 = communality. Saturations $\geq .30$ are shown

The first factor is *School environment*. This comprises items Q49, Q50, Q51, Q53, Q54, Q55, Q56, Q57, Q58, Q59, Q60, Q61, Q62, Q63, Q64, Q65, Q66, Q67, and Q68 and evaluates the student's relationships with the school environment, explaining 17.94% of the variance. The second factor, *Relationship with classmates*, com-

prises items Q39, Q41, Q42, Q43, Q44, Q45, Q46, and Q48. This factor evaluates the relationship of trust and help among classmates, and explains 5.40% of the variance. The third factor is called *Personal expectations* and comprises items Q13, Q15, Q18, Q19, Q20, Q22, Q23, Q24, Q25, Q26, Q28, Q29, and Q31. This evalu-

ates the expectations associated with success in study and explains 5.175% of the variance. The fourth factor corresponds to *Social capital*. It comprises items Q77, Q78, Q86, Q87, Q90, Q137, and Q138, and evaluates the personal relationships and bonds that might provide access to different resources, explaining 4.53% of the variance. The fifth factor, *ITC resources*, comprises items Q132, Q133, and Q134 that evaluate access to information and communication technologies that can facilitate learning, explaining 3.55% of the variance. The sixth factor, *Climate in class*, comprises items Q69, Q70, Q71, Q72, Q73, Q73, Q75, and Q76 and evaluates the quality of coexistence in the peer group, explaining 3.40% of the variance. Finally, the seventh factor is called *Family support*; this comprises items Q79, Q80, Q81, Q82, Q84, and Q85 and evaluates the intensity of support for study and schooling from the immediate family and explains 2.92% of the variance.

Table 4 displays the main results of the analysis of the items. Specifically, their description (using the mean as a measure of difficulty), the item-total for the factor correlation if the item is eliminated, and Cronbach's Alpha for each factor if the item is eliminated. The Table shows that the item-total correlations are greater than 0.3 in all of the cases except in items 19, 137, and 138. Similarly, it shows that, apart from item 138, in no case does the Alpha increase if the item is eliminated.

The results reliability analysis (Table 5) shows that the internal consistency of the factors of the questionnaire (normalised scores) is satisfactory. These display values for Cronbach's Alpha greater than 0.8 for factors 1, 2, 3, and 6, a value of 0.76 for factor 7, and values of under 0.7 for factors 4 and 5, with a mean of 0.77. The same Table also shows the mean descriptors and standard deviation for the 7 factors, as well as the correlations between latent factors.

TABLE 4. Result of the analysis of the items, by difficulty indices and the item-total correlation.

	Mean	Standard deviation	Corrected element-total correlation	Cronbach's Alpha if the element is eliminated
FACTOR 1				
Q49 Value teachers' advice.	2.147	1.071	.539	.908
Q50 Teachers concerned.	2.199	1.061	.722	.904
Q51 Talk about problems w. teachers.	1.801	1.069	.562	.908
Q53 Fairness of teachers.	2.400	1.104	.672	.905

	Mean	Standard deviation	Corrected element-total correlation	Cronbach's Alpha if the element is eliminated
Q54 Teachers listen.	2.381	1.141	.658	.905
Q55 Feel comfortable with teachers.	2.027	1.003	.757	.903
Q56 Teachers use unfair punishments.	2.456	1.238	.429	.912
Q57 Teachers keep promises.	2.654	1.039	.579	.907
Q58 Teachers respect me.	1.709	.891	.695	.905
Q59 Feels valued by teachers.	2.197	1.170	.471	.910
Q60 Talk openly with teachers.	2.123	1.112	.660	.905
Q61 High expectations from teachers.	1.630	.807	.556	.908
Q62 Teachers do not help.	2.410	1.230	.454	.911
Q63 Teachers help.	2.263	1.076	.547	.908
Q64 Teachers pay attention to me.	2.374	1.053	.607	.907
Q65 No advice from teachers.	2.470	1.154	.429	.912
Q66 Teachers give explanations.	1.972	1.005	.619	.906
Q67 High expectations of group.	1.669	.841	.429	.911
Q68 Capacity for reflection.	1.713	.935	.501	.909
FACTOR 2				
Q39 Isolated at school.	1.549	.956	.480	.827
Q41 Make friends easily.	1.925	1.010	.629	.806
Q42 Bullying.	1.401	.792	.427	.831
Q43 Good relationship with classmates.	1.715	.850	.643	.806
Q44 Respected by classmates.	1.837	.918	.702	.797
Q45 Classmates help each other learn.	2.176	1.013	.525	.822
Q46 Team work.	1.818	.904	.527	.820
Q48 Help from classmates.	1.740	.928	.583	.813
FACTOR 3				
Q13 University studies.	3.911	1.434	.335	.804
Q15 Not continuing studies.	4.787	.716	.318	.797
Q18 Motivation to study.	4.086	.963	.602	.774
Q19 Social mobility.	4.251	.986	.244	.804
Q20 Interest in learning.	3.941	1.008	.484	.784

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	Mean	Standard deviation	Corrected element-total correlation	Cronbach's Alpha if the element is eliminated
Q22 Obligated to study.	3.923	1.152	.487	.783
Q23 No alternative to studying.	4.104	1.198	.412	.791
Q24 No reason to study.	4.581	.816	.532	.782
Q25 Waste of time.	4.677	.743	.563	.781
Q26 Unable to continue studying.	4.610	.816	.464	.787
Q28 Learning at school.	3.881	.944	.481	.784
Q29 Useful preparation.	3.788	1.095	.471	.785
Q31 Effort in class.	3.539	1.028	.415	.790
FACTOR 4				
Q77 Family teacher communication.	2.995	1.283	.392	.582
Q78 Family-school engagement.	3.676	1.278	.417	.574
Q86 Support from role model.	2.683	1.381	.318	.607
Q87 Neighbourhood participation.	3.672	1.398	.456	.558
Q90 Value extracurricular activities.	2.290	1.219	.350	.596
Q138 Volunteering.	3.523	1.297	.209	.640
Q137 Extracurricular activities.	3.870	.933	.284	.616
FACTOR 5				
Q132 Computer at home.	3.262	.889	.516	.264
Q133 Own computer.	4.712	.471	.431	.323
Q134 Internet.	4.926	.266	.336	.532
FACTOR 6				
Q69 No attention in class.	2.949	.903	.399	.801
Q70 Noise in class.	2.789	1.101	.560	.779
Q71 Class environment.	3.151	1.145	.534	.783
Q72 Start of class.	3.162	1.190	.483	.791
Q73 Attending class.	3.386	1.117	.519	.785
Q74 Attention in class.	3.461	1.062	.608	.772
Q75 Homework.	3.304	1.111	.578	.776
Q76 Effort by classmates.	3.520	1.001	.473	.791

	Mean	Standard deviation	Corrected element-total correlation	Cronbach's Alpha if the element is eliminated
FACTOR 7				
Q79 Family supports studies.	1.835	1.259	.420	.728
Q80 Family encourages studies.	1.575	.908	.602	.688
Q81 Family help w. homework.	2.415	1.427	.429	.732
Q82 Family monitors schoolwork.	1.847	1.205	.385	.737
Q84 Family pride.	2.000	1.123	.537	.695
Q85 Family-student communication.	1.739	1.085	.613	.676

Source: Own elaboration.

TABLE 5. Consistency, descriptors, and correlations between the factors of the QDSS.

	Alpha normalised items	M	SD	F1	F2	F3	F4	F5	F6
F1: School environment.	.915	40.59	12.52						
F2: Relationship with classmates.	.835	14.16	5.04	.426**					
F3: Personal expectations.	.814	54.08	7.14	-.448**	-.289**				
F4: Social capital.	.634	22.70	4.94	.218**	.216**	-.111**			
F5: ITC study resources.	.687	12.90	1.29	-.015..	-.098*	.022..	-.118**		
F6: Climate in class.	.806	25.72	5.64	-.241**	-.345**	.147**	-.078*	.022..	
F7: Family support.	.761	11.41	4.69	.386**	.351**	-.337**	.227**	-.143**	-.131**

Source: Own elaboration.

* $p \leq 0.05$; ** $p \leq 0.01$

This gives the questionnaire its final form. It comprises 65 items in 7 factors: a) *school environment* (19 items), b) *relationship with classmates* (8 items), c) *personal expectations* (13 items), d) *social capital* (7 items), e) *ITC study resources* (3 items), f) *climate in class* (8 items), and g) *family support* (6 items). The score for each factor is obtained by simple addition after inverting the scores of items Q15, Q22, Q23, Q24, Q25, Q26, Q39, Q42, Q56, Q59, Q62, Q65, Q69, Q70, Q71, and Q72.

The results from comparing the groups are shown in Table 6. Regarding gender, there are significant differences in the *school environment*, *family support*, and *personal expectations* factors, with male students showing significantly higher scores in the first two, while the score for personal expectations is greater for female students.

As for educational level when responding (ESO, Baccalaureate), the scores are significantly higher for the baccalaureate students in *social capital* and *climate in the classroom*, and are higher in *ITC resources* for the ESO students.

Differences can also be seen in some factors according to the average grade from the previous year. For students who averaged a fail grade, their scores are significantly higher in *school environment* and significantly lower in *personal expectations*. Finally, the score in factor 7, regarding *family support*, was significantly lower for those students whose average grade was very good or excellent.

Being born inside or outside Spain also generated significant differences in some

factors. *School environment* and *ITC resources* show higher scores for those born in Spain, while for the students born outside Spain, *family support* obtains significantly higher scores.

The period of residence in the city also relates to differences regarding *ITC resources*. In this case, the score for those who have spent 10-15 years there is significantly higher than the score of those who arrived under 5 years ago.

As for the maximum level of studies attained by the parents, there are significant differences in the *ITC resources* and *family support* factors, although these differences are not the same for the educational level of their mother or father. In the case of the mother, *ITC resources* scores are significantly higher if the mother has completed the baccalaureate or CFGS (Higher Level Training Cycle), while in the case of the father the score is only significantly higher if they have completed second cycle university studies. As for *family support*, the differences follow a less stable pattern, especially in the case of the mother; those students whose mother achieved a maximum of first or second cycle university studies or studied for the baccalaureate or CFGS (completed or not), obtained significantly lower scores in *family support* than the remaining groups, while with regards to the father's education, the differences in this factor are only significantly higher if they stated that they do not have studies. The parents' employment status does not create significant differences in any of the factors.

TABLE 6. Comparison of averages results by different sociodemographic variables.

	F1	F2	F3	F4	F5	F6	F7
Gender							
Male	41.83**	14.39	52.76**	22.56	12.93	25.42	11.94**
Female	39.36**	13.91	55.37**	22.88	12.87	26.03	10.88**
Year							
Y4 ESO	40.95	14.30	53.89	22.44**	12.95**	25.20**	11.48
Y1 BACC.	38.99	13.55	54.88	23.91**	12.67**	28.03**	11.11
Country of birth							
Spain	41.03*	14.10	53.97	22.73	12.97**	25.67	11.15**
Outside Spain	38.34*	14.33	54.77	22.49	12.58**	25.96	12.66**
Years in the city							
<5	40.57	15.63	54.64	21.55	12.55**	26.84	12.39
6-9	38.26	14.35	54.92	23.46	12.56	25.96	12.96
10-15	41.62	14.52	54.35	22.57	13.02**	25.21	11.67
>15	41.00	14.95	52.65	21.57	12.76	23.33	12.05
Average grade year							
Fail	46.32	15.01	49.61	22.39	12.67	24.89	13.02
Pass	41.45**	14.53	53.14**	22.60	12.79	25.52	11.82
Good	40.65**	14.34	53.94**	23.11	12.80	25.89	11.79
Very good	38.26**	13.56	56.10**	22.46	13.16**	25.21	10.37**
Excellent	35.55**	12.14	59.09**	22.55	12.90	24.51	8.44**
Mother's level of studies							
No education	40.42	15.09	51.85	13.18	12.32	25.85	13.72
Primary education completed	39.24	13.36	54.45	23.25	12.71	25.91	11.92
Baccalaureate or CFGS incomplete	40.38	14.35	54.83	22.39	12.80	25.78	11.29**
Baccalaureate or CFGS complete	39.69	13.61	54.91	22.94	13.05**	25.93	10.48**
Incomplete university studies	41.24	14.22	55.13	22.29	13.06**	25.66	11.59
University studies 1st cycle	41.45	13.27	54.18	22.29	13.05**	26.18	10.55**
University studies 2nd cycle	43.73	14.04	53.13	21.71	13.30**	25.19	10.53**

	F1	F2	F3	F4	F5	F6	F7
Father's level of studies							
No education	42.66	14.93	51.81	24.42	12.63	25.29	12.53**
Primary education completed	39.41	13.69	53.74	22.62	12.68	26.30	11.63
Baccalaureate or CFGS incomplete	40.65	14.12	54.91	23.03	12.98	25.87	11.99
Baccalaureate or CFGS complete	39.75	13.81	54.89	22.04	13.05	25.69	10.54
Incomplete university studies	38.82	14.34	54.46	22.44	13.05	25.46	11.17
University studies 1st cycle	41.96	13.53	54.05	22.03	13.12	25.83	10.55
University studies 2nd cycle	42.96	14.21	54.21	22.27	13.20**	24.83	11.26
Mother's employment status							
Working	40.80	14.03	54.15	22.70	12.99	25.59	11.36
Unemployed	40.47	14.37	53.76	22.88	12.69	25.90	11.52
Retired	39.81	13.81	53.55	21.64	12.81	25.67	11.05
Father's employment status							
Working	40.63	14.17	54.14	22.46	13.01	25.70	11.33
Unemployed	39.58	13.95	53.87	23.08	12.43	25.97	11.18
Retired	39.97	13.50	53.68	23.04	12.98	25.35	10.94

Source: Own elaboration.

NOTE: F1: School environment; F2: Relationship with classmates; F3: Personal expectations; F4: Social capital; F5: ITC study resources; F6: Climate in class; F7: Family support.

* $p \leq 0.05$; ** $p \leq 0.01$

4. Discussion

In this study, the internal structure and psychometric properties of the QDSS in a sample of 858 students from year 4 of ESO and year one of Baccalaureate (2014-15) was analysed. The analysis of the socio-demographic variables confirms the absence of bias and confirms that the sample is representative of other metropolitan areas of Spain. If year of birth is considered, 89.5% of the participants have not had to repeat a school year and just a 4% of them had obtained an aver-

age grade for the year of *fail*. The data point towards a common phenomenon in secondary education: early school leaving by students who have had to repeat a year when they turn 16 (year 3 of ESO or first term of year 4 of ESO). Therefore, we consider that the sample is more focussed on success and fits well with the objective of our research.

With regards to the validation of the QDSS, after performing a non-orthogonal PCA and weighing up different factorial solutions, the solution with 7 factors dis-

played the greatest theoretical coherence and best psychometric adequacy. Following statistical and rational criteria, 21 of the 86 initially designed items were eliminated, and so the final version comprises 65 items.

The version presented has good psychometric properties, providing a theoretically coherent factorial structure with acceptable reliability in the factors. Only factors 4 and 5 obtained a low consistency, however, they have been retained owing to their theoretical usefulness, given that they make it possible to consider social capital and ITC resources for study as potential factors in educational success (Bravo and Verdugo, 2007; Moliner, 2008; OCDE, 2013; Pedró, 2012; Pozo et al., 2012).

The initial questionnaire structure had 9 factors, resulting from the theoretical research that had been performed. Of these factors, 6 were kept after the statistical analysis (Table 4): *relationship with classmates*, *personal expectations*, *social capital*, *access to study resources* (focussed on access to *ITC resources*), *climate in class*, and *family support*. And one factor was created, which was called *school environment*, that combines items from the initial theoretical factors: *Student-teacher trust*, *Teaching-learning model*, and *Inclusion in the school*. Although the differences could theoretically be established, it may be the case that students differ little between teaching/didactic methods and their perception of help, welcoming, and good treatment by the teacher. On the other hand, the behaviour of the items from the initial *Inclusion in the school* factor is clearly polarised between the

general evaluation of the school and the evaluation of the relationship between peers. In summary, feeling that the school is useful or beneficial and good social relations with classmates, would explain the feeling of belonging to the school.

Consequently, we believe that the factorial structure of the QDSS has a good theoretical fit, combining in a single instrument the principal factors that are connected as determinants or precursors of success at school according to the literature (Longás et al., 2016). The final composition of the instrument makes it possible to recognise the existence of school, family, and community determinants. The importance of *personal expectations* as a driver of success is in itself an individual factor that is constructed both inside and outside school in interaction with other people (Longás, et al., 2016). From the set of factors, it is worth noting the recognition of the social or relational dimension of success at school. Therefore, while *social capital* as a factor does not have a high consistency, *relationship with classmates* and *family support*, as well as particular *school environment* items, could add to the reflection on this interesting construct as explaining success at school (Coleman, 1988).

The behaviour of the factors by socio-demographic variables also requires a brief discussion. Various studies that link gender and success at school show that female students have lower rates of early school leaving and a larger percentage of them complete higher education (Calero et al., 2010). Our research might indicate an explanatory factor. The determinant factors of greater success in male students are, with a significant difference, *school*

environment and *family support*, both of which are extrinsic to the person, while for female students the factor with significantly higher values is *personal expectations*. This factor, which is intrinsic, could more consistently shape success in their school career (Torres-Acosta et al., 2013). Something similar might explain better results in some factors (*social capital* and *climate in the classroom*) for the baccalaureate educational level where students have a more clearly defined pathway and are integrated into more demanding levels that require greater autonomy and responsibility (Roorda et al., 2011; Pàmies, 2013; Santana and Feliciano, 2011). The characteristics of the responsible personality, not measured in the QDSS, could explain the differences in the significantly lower perception of family support, something that is vital for success when there are levels of low personal autonomy or of psychological immaturity.

The high rating of *school environment* by students with low average grades could be an implicit recognition of the school's assistance in their trajectory, while low *personal expectations* would be a consequence of a school career with limited success (possible reverse causality).

Comparing Spanish students and foreign ones reveals differences that are difficult to explain. The high scores in favour of the Spanish students, in *school environment* and *ITC resources* might be because of better integration, while high *family support* in immigrant students is a more decisive factor for people who must integrate into a culture and educational system different to those of their country of origin.

Regarding the parents' *level of studies*, the significantly higher values in *ITC resources* correspond with higher levels of education, which as well as greater sensitivity can also indicate greater economic resources. As for *family support*, this is significantly higher if the mother has low levels of education or the father has very low ones. It is worth evaluating whether a greater or lesser presence of the parents in the home has an influence on the students' views of situations of unemployment or employability difficulties that relate to the levels of education – something that our results appear not to support even though other studies do (Collet and Tort, 2011; García Alegre, 2012) – or indirectly the influence of parents' levels of education on family models and the degree of development of the children's autonomy.

5. Conclusions

The good psychometric properties of the QDSS allow a broad and parsimonious evaluation of what the main determinant factors are for success at school in deprived backgrounds.

Our results must be considered in the light of certain limitations. On the one hand, we only have self-reported data, something that could imply bias owing to possible intentionality in the responses (social desirability or exaggerating difficulties, for example). Furthermore, the sample mainly comprises Caucasian subjects, something that might reduce the generalisability of its results to people from other cultures. How success at school is evaluated is also a limitation; the aver-

age grade for the last completed year was chosen as the measure of the dependent variable for this study, although other information such as the number of fails per evaluation or average grades in core subjects are also used in other research and are just as open to criticism. This decision made it possible to have objective and reliable information, provided by the schools, in light of the impossibility of having standardised tests of competencies for all of the components of the sample.

We believe that combined use of the QDSS with the other validated instruments mentioned in this article opens up opportunities for research into success at school. Therefore, we offer the academic community a questionnaire that quickly and reliably evaluates the factors that might decide it.

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This is the English version of the research articles and book reviews published originally in the Spanish printed version of issue 269 of the **revista española de pedagogía**. The full Spanish version of this issue can also be found on the journal's website <http://revistadepedagogia.org>.



ISSN 0034-9461 - Depósito legal: M. 6.020 - 1958

e-ISSN 2174-0909 Rev. esp. pedagog. (Internet)

INDUSTRIA GRÁFICA ANZOS, S.L. Fuenlabrada - Madrid