Revista de Psicodidáctica, 2019, 24 (2), 103–110

Revista de Psicodidáctica

www.elsevier.es/psicod

Original article

Perfectionism Profiles and Academic Causal Self-attributions in Spanish Primary Education Students☆

María Vicent[a,*], Cándido J. Inglés[b], Carolina Gonzálvez[a], Ricardo Sanmartín[a], María Pilar Aparicio-Flores[a], and José Manuel García-Fernández[a]

[a] *Universidad de Alicante, San Vicente del Raspeig, Alicante, Spain*
[b] *Universidad Miguel Hernández, Elche, Alicante, Spain*

ARTICLE INFO

Article history:
Received 5 June 2018
Accepted 9 January 2019
Available online 1 March 2019

Keywords:
Perfectionism
Academic causal self-attributions
Latent class analysis
Primary Education

ABSTRACT

The aim of this study is to identify the relationship between child perfectionism and academic causal self-attributions using a dual approach: variable-oriented and person-oriented. The sample consists of 431 Spanish students (49.42% girls) between the ages of eight and 11 years ($M = 9.60$, $SD = 1.08$). The *Child and Adolescent Perfectionism Scale* and the *Sydney Attribution Scale* are employed. Three perfectionism profiles are identified using latent class analysis: *high perfectionism*, *moderate perfectionism* and *non-perfectionism*. *Non-perfectionism* scores significantly higher than *high* and *moderate perfectionism* on failure and success self-attributions to external causes, although in the case of success, these differences are only significant for the language area and the total scores. In contrast, *non-perfectionism* scores significantly lower than the other two profiles on self-attributions of failure to lack of effort. Effect sizes for the observed differences are generally moderate (d = between 0.44 and 0.75). In addition, results of the bivariate and partial correlational analyses indicate the shared and unique relationships between perfectionist dimensions and causal self-attributions. Thus, it allows discussing the perfectionist dimension which explains the inter-class differences found.

Perfiles de perfeccionismo y autoatribuciones causales académicas en estudiantes españoles de Educación Primaria

Palabras clave:
Perfeccionismo
Autoatribuciones causales académicas
Análisis de clases latentes
Educación Primaria

RESUMEN

El objetivo de este estudio es analizar la relación entre el perfeccionismo infantil y las autoatribuciones causales académicas a través de un doble enfoque: centrado en la variable y en la persona. La muestra se compone de 431 estudiantes españoles (49.42% mujeres) con edades comprendidas entre los ocho y los 11 años ($M = 9.60$, $DE = 1.08$). Se utilizan la *Child and Adolescent Perfectionism Scale* y la *Sydney Attribution Scale*. A través del *latent class analysis* se obtiene una solución de tres perfiles perfeccionistas: *perfeccionismo alto*, *perfeccionismo moderado* y *no-perfeccionismo*. El grupo *no-perfeccionismo* obtiene puntuaciones significativamente más altas que el *perfeccionismo alto* y *moderado* en las autoatribuciones del fracaso

PII of original article:S1136-1034(18)30160-6.

☆ Please cite this article as: Vicent M, Inglés CJ, Gonzálvez C, Sanmartín R, Aparicio-Flores MP, García-Fernández JM. Perfiles de perfeccionismo y autoatribuciones causales académicas en estudiantes españoles de Educación Primaria. *Revista de Psicodidáctica*. 2019;24:103–110.

* Corresponding author.
E-mail address: maria.vicent@ua.es (M. Vicent).

y el éxito a causas externas, aunque en el caso del éxito, estas diferencias solo son significativas para el área de lenguaje y el total de las puntuaciones. Por el contrario, el *no-perfeccionismo* puntúa significativamente más bajo que los otros dos grupos en las autoatribuciones del fracaso a la falta de esfuerzo. Los tamaños del efecto para estas diferencias son, generalmente, moderados (d = entre 0.44 y 0.75). Además, los resultados de los análisis de correlaciones bivariadas y parciales muestran la relación compartida y única entre las dimensiones perfeccionistas y las autoatribuciones causales, permitiendo discutir qué dimensión perfeccionista explica las diferencias interclase encontradas.

Introduction

According to Flett et al. (2016), child perfectionism is conceptualized on the basis of two dimensions: *socially prescribed perfectionism* (SPP) or beliefs about the perfectionist demands and criticisms of others; and *self-oriented perfectionism* (SOP), referred to self-criticism, efforts to achieve perfection and high standards. Although most of the accumulated knowledge about perfectionism is related to clinical psychology and studies developed in adult and/or clinic population, several authors highlight the importance of examining its impact in real life situations such as the school context (Bieling, Israeli, Smith, & Antony, 2003).

The way in which perfectionists react to success and failures has aroused some interest in recent years (e.g., Egan, Piek, Dyck, Rees, & Hagger, 2013; Stoeber, Kobori, & Tanno, 2013). Thus, taking into account that perfectionists are characterized by pursuing excessively high goals, being too self-critical and interpreting the results in dichotomous terms, it is considered that they are more likely to perceive achievements as failures and to experience greater emotional distress (Stoeber, Schneider, Hussain, & Matthews, 2014). In this sense, according to Weiner's attribution theory (see Weiner, 2010, for a review), the causal attributions made by an individual to their successes or failures condition their future expectations and feelings, and both, expectations and emotions, condition the action. This theory tries to explain how individuals invoke explanations of different situations, as well as the impact of these cognitions on their behaviour (Gulliford & Miller, 2015). As a result, it is one of the most relevant approaches for the understanding of human motivation and it has important contributions in the educational field (Graham & Taylor, 2016). Specifically, Weiner identifies three dimensions to classify any cause: (a) *locus of control*, whether the cause is internal or external to the person; (b) *stability*, that is, if the cause is stable or unstable, depending on its persistence; and (c) *controllability*, depending on the degree of influence on the cause.

The *locus of control* affects self-esteem and feelings of pride, while *stability* influences expectations, which in turn generate feelings of hope or hopelessness. Finally, the dimension of *controllability* generates various types of feelings such as shame, guilt, anger, etc. (Weiner, 2014). Thus, in situations of success, the most adaptive pattern is to attribute the result to internal, unstable and controllable causes, such as effort, while in situations of failure, it is appropriate that students do not attribute their results to internal, stable and not controllable causes, such as the ability (Perry & Hamm, 2017), because their self-esteem will be diminished, the expectations of a new future failure will increase and feelings of hopelessness and shame will be generated.

Perfectionism and causal self-attributions

There are several studies that provide preliminary data about the way in which certain perfectionist dimensions are linked to the causal explanations of academic successes and failures. The first study in this sense was published by Flett, Hewitt, Blankstein, and Pickering (1998) with American university population (N = 124; M_{age} = 22.46). According to the results of this study, *SPP* is linked to the tendency to attribute successes and failures to external causes. Subsequently, Brown et al. (1999) examine the link between the perfectionist dimensions of *concern over mistakes* and *personal standards* and the causal explanations that a group of 90 American university women offer about test scores below expectations. *Concern over mistakes* is positively associated with the tendency to perform negative internal attributions (e.g., "I never do well on exams"). On the contrary, the *personal standards* dimension is associated with a lower probability of attributing low qualifications to internal causes of negative nature, unstable elements related to performance (e.g., "I did not study enough") and external causes (e.g., "The exam was unfair").

In accordance with the results of Bieling et al. (2003), the subjects with high levels in the perfectionist dimensions of the *Multidimensional Perfectionism Scale* (FMPS; Frost, Marten, Lahart, & Rosenblate, 1990) score significantly lower than those with low levels of perfectionism in attributions to internal causes, employing a sample of 198 Canadian college students between 10 and 50 years old. Moreover, Blankstein and Winkworth (2004), with 387 Canadian university students (M_{age} = 20.7), find that *SPP* is significantly and positively associated with a wide variety of causal explanations to problems in academic qualifications, both internal and external. On the other hand, SOP does not show a pattern of correlations as extensive as SPP because it only positively and significantly associates with *maladaptive cognitions* (e.g., "My problem is partly due to unrealistic high standards I set for myself"). At the same time, Neumeister (2004) analyses the attributional process in 12 American gifted college students, finding evidence of a positive association between *SPP* and attributions of successes to external causes, as well as failures to internal causes. On the contrary, *SOP* is more closely linked to the attribution of successes to internal causes. Recently, Li, Lan, and Ju (2015) recruited a sample composed of 493 Chinese university students (M_{age} = 21.03), finding that individuals with high perfectionism tend to attribute their successes and failures to internal causes.

In the field of sports, Anshel and Mansouri (2005) obtain, in 30 American university male athletes aged between 19.6 and 22.8, that high levels of perfectionism (assessed through the FMPS; Frost et al., 1990) are linked to the attribution of failures to internal causes, particularly in the *concern over mistakes* dimension. In this line, Stoeber and Becker (2008), in 74 female soccer players from United Kingdom, analyze the association between the perfectionist dimensions (*perfectionistic strivings* and *negative reactions to imperfection*) and the causal attributions to the successes and failures in the sports field. Results from partial correlation analysis show that *perfectionist strivings* are significantly and positively associated with attributions of success to internal causes, as well as negatively with attributions of failure to internal causes. Conversely, the *negative reactions to imperfection* dimension is significantly and negatively related to the attributions of success to internal causes and failures to external causes.

Finally, it is worth mentioning the contributions of Levine, Werner, Capadi, and Milyavskaya (2017) who analyze the relationship between perfectionist dimensions (i.e., *self-critical, SOP, personal standards* and *concerns over mistakes*) and causal

attributions for success and failure in achieving life goals in Canadian university population through a double study ($N = 185$, $M_{age} = 21.80$ and $N = 240$, $M_{age} = 20.2$, respectively, for Study 1 and 2). Both studies allow the authors concluding that students with high levels of *self-critical* and *concern over mistakes* tend to attribute their successes to external causes. On the contrary, students with high levels of *personal standards* and *SOP* usually attribute their failures to external causes, whereas they are less likely to perform external causal attributions in situations of success.

Several limitations are observed from the review of the previous empirical literature relating perfectionism and causal attributions. First, the results are contradictory, so there is no consensus on the way in which perfectionism is related to the attributional process. This problem could be partially explained by the use of different scales for the assessment of both variables (perfectionism and attributions), as well as the scope or domain of the study (i.e., academic, sports, etc.), which hampers the results comparison. Secondly, regarding the characteristics of the sample, all the cited works have employed university population. Therefore, the relationship between attributional trends and perfectionism during childhood and adolescence is unknown at present. However, taking into account that attributional thinking develops from 7 to 8 years of age (see, Alonso-Tapia, 1984, for a review) and that maladaptive perfectionist trajectories emerge at the beginning of formal education (Hong et al., 2017), school age is an essential stage for the detection, prevention and modification of possible dysfunctional tendencies in both constructs. Likewise, several works have recruited small samples or with characteristics that make difficult the generalization of the results, such as, for example, the employment of participants of the same sex (e.g., Anshel & Mansouri, 2005; Brown et al., 1999; Stoeber & Becker, 2008). Finally, all these studies have been based on a variable-oriented approach.

Certainly, although this approach has traditionally characterized research on perfectionism in general, there are more and more studies that analyze perfectionism from a person-oriented perspective. In fact, empirical evidence shows that both approaches are complementary (Lundh, Saboonchi, & Wangby, 2008). Thus, while the variable-oriented approach allows understanding the nature of each perfectionist dimension and its differential association with other constructs, the person-oriented approach brings us closer to the "real subject". Besides, it is very common to analyze individuals with different intensity profiles in the perfectionist dimensions, which, in turn, are associated with different outcomes (Lundh et al., 2008).

Profiles of child perfectionism: a person-oriented approach

There is a lack of studies that examine profiles of perfectionism in children under 12 years old (e.g., Inglés, García-Fernández, Vicent, Gonzálvez, & Sanmartín, 2016; Vicent, Inglés, Sanmartín, Gonzálvez, & García-Fernández, 2017). These works have been carried out in Spanish population between 8 and 11 years old in order to replicate the 2×2 model (Gaudreau & Thompson, 2010). Thus, using a non-hierarchical method, both studies obtain a four-cluster solution concordant with the 2×2 model: *pure SPP*, *pure SOP*, *mixed* and *non-perfectionism*. However, although the use of cluster analysis techniques (either hierarchical or non-hierarchical) has commonly characterized research about profiles, latent class analysis (LCA) is now considered to be a more appropriate technique as it overcomes several of the cluster analysis limitations (Schreiber, 2017).

Recently, several works that use LCA technique have been published in the field of research in perfectionism, although there are very few studies in children, with the exception of the work of Herman, Trotter, Reinke, and Ialongo (2011) who recruit a sample of African-American sixth grade students ($M_{age} = 11.22$). Thus, they obtain four classes (i.e., *non-critical, critical, non-perfectionist* and *non-striving*) using a three-dimensional version of the *Child and Adolescent Perfectionism Scale* (CAPS-14; McCreary, Joiner, Schmidt, & Ialongo, 2004).

The class solutions obtained by previous literature vary significantly from one study to another, probably due to the use of different scales. For instance, studies that use the *Almost Perfect Scale-Revised* (Slaney, Rice, Mobley, Trippi, & Ashby, 2001) agree on finding a solution of three classes: *adaptive perfectionists, maladaptive perfectionists* and *non-perfectionists* (e.g., Moate, Gnilka, West, & Bruns, 2016; Wang, Permyakova, & Sheveleva, 2016), whereas Sironic and Reeve (2015), using three perfectionism scales, obtain a six-class solution: *adaptive perfectionist, externally motivated maladaptive perfectionist, mixed maladaptive perfectionist, non-perfectionist A*, *non-perfectionist B*, and *order and organization non-perfectionist*.

The present study

The purpose of this study is to clarify the relationship between perfectionism and academic causal self-attributions in children. This goal is intended to be achieved through a double approach: variable-oriented and person-oriented. Thus, first of all, the bivariate and partial correlations between perfectionist dimensions (i.e., SPP and SOP) and causal self-attributions are analyzed. In this sense, it is expected that results of the partial correlations differ from the bivariate correlations, since they represent the unique and shared relationship (Stoeber & Gaudreau, 2017) between the perfectionist dimensions and the causal self-attributions. Secondly, the LCA is used to check whether different groups of Primary Education students, classified according to their profile of perfectionism, differ on the type of academic self-attributions they present. Based on previous clustering studies carried out with k-means in Spanish child population (e.g., Inglés et al., 2016; Vicent et al., 2017), it is expected to find a model of four latent classes (i.e., *pure* SPP, *pure* SOP, *mixed* and *non-perfectionism*). In the case of finding this four-class model, it is expected that the mixed group will obtain the most maladaptive results (Inglés et al., 2016; Vicent et al., 2017). According to the attributional theory, these maladaptive results would consist of attributing successes to external and uncontrollable causes, such as luck or difficulty of the task, as well as failures to internal, stable and uncontrollable causes, such as lack of ability (Perry & Hamm, 2017).

Method

Participants

In this study 431 Spanish students aged 8 to 11 years old ($M_Y = 9.60$, $SD_Y = 1.08$) participate. The sample has been recruited by multistage random cluster sampling. Firstly, between one and two centres for each geographical area of the province of Alicante (Spain) are selected: north, south, east and west. From the six public schools that participate in the research, a group for each academic year from 3rd to 6th of Primary Education is selected. The sample consists of 84, 117, 116 and 114 students aged 8, 9, 10 and 11 years, respectively (212 girls and 219 boys). There are no significant differences between the eight groups of sex $\times$ age ($\chi^2 = 5.58$, $p = .13$). 91.42% of students identify themselves as Spanish, 6.25% Arab, 5.34% Latin American and 1.62% of other origins.

Instruments

Child and Adolescent Perfectionism Scale (CAPS; Flett et al., 2016). This instrument assesses *SPP* (10 items; e.g., "My teachers expect my work to be perfect") and *SOP* (12 items; e.g., "I try to be

Table 1
Reliability, average variance extracted, means, standard deviations and bivariate and partial correlations between the factors of the CAPS and SAS

		Bivariate correlations		Partial correlations		α	ω	CRI	AVE	*M*	*SD*
		SOP	SPP	SOP	SPP						
Language	*Success/ability*	.09	−.02	.12*	−.09	.91	.91	.90	.62	3.24	1.16
	Success/effort	.09	−.02	.13**	−.10*	.86	.86	.86	.51	3.38	1.02
	Success/external	−.12*	−.13**	−.05	−.07	.73	.72	.73	.32	4.03	1.02
	Failure/ability	.08	.12*	.01	.09	.87	.87	.87	.53	1.24	1.13
	Failure/effort	.16**	.13**	.10*	.04	.77	.77	.77	.36	1.65	1.04
	Failure/external	−.14**	−.09	−.11*	−.00	.75	.75	.75	.33	4.38	.99
Maths	*Success/ability*	.15**	.02	.18***	−.10*	.88	.88	.88	.56	2.77	1.23
	Success/effort	.10*	.00	.13**	−.08	.82	.82	.83	.45	3.25	1.01
	Success/external	−.01	−.01	.01	−.01	.70	.70	.70	.28	3.78	1.02
	Failure/ability	.01	.05	−.03	.06	.86	.85	.86	.50	1.40	1.13
	Failure/effort	.13**	.18***	.03	.13**	.74	.74	.76	.33	1.81	1.05
	Failure/external	−.19***	−.12*	−.15**	−.00	.68	.68	.68	.27	4.24	.96
Total	*Success/ability*	.14*	.00	.18***	−.11*	.90	.90	.90	.42	6.02	2.05
	Success/effort	.10*	−.01	.14**	−.10*	.90	.90	.91	.45	6.64	1.90
	Success/external	−.07	−.08	−.02	−.05	.82	.82	.82	.28	7.82	1.86
	Failure/ability	.05	.10*	−.01	.09	.90	.90	.90	.43	2.64	2.02
	Failure/effort	.15**	.17**	.07	.09	.86	.86	.86	.35	3.46	1.96
	Failure/external	−.17***	−.11*	−.14**	−.00	.84	.84	.84	.31	8.63	1.84
A		.71	.77	–	–	–	–	–	–	–	–
Ω		.70	.79	–	–	–	–	–	–	–	–
CRI		.70	.80	–	–	–	–	–	–	–	–
AVE		.29	.32	–	–	–	–	–	–	–	–
M		39.06	28.75	–	–	–	–	–	–	–	–
SD		7.69	8.33	–	–	–	–	–	–	–	–

Note. *AVE*: average variance extracted, *CRI*: composite reliability index.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

perfect in everything I do") using a 5-point Likert scale. Specifically, the translated version into Spanish by Castro et al. (2004), whose reliability levels are α = .82/.92 (SPP) and .75/.92 (SOP), is employed.

Sydney Attribution Scale (SAS; Marsh, 1984). The scale is composed by 75 items that assess the causal explanations (ability, effort and external causes) in situations of success (e.g., "You are one of the best in that subject", "You work hard in that class", and "You are the teacher's favourite") and failure (e.g., "I am not good at that subject", "I have to work more", and "It was a very difficult task") in the area of Language and Maths. It entails 12 factors to which six general scores resulting from the addition of the scores obtained in both areas can be added, generating a total of 18 factors. The reliability levels, Cronbach's Alpha, range between .70 and .86 (Marsh, 1984). In this study, the adapted version to the Spanish population by González-Pumariega, Núñez, and González-Pienda (1996) is used.

Table 1 shows the reliability coefficients, Cronbach's Alpha and Omega, composite reliability and average variance extracted for the different subscales of CAPS and SAS in this study.

Procedure

This research is approved by the ethics committee of the University of Alicante (UA-2017-09-05). A meeting has been arranged with the directors of the selected schools to participate in this study in order to inform them about the aims and invite them to collaborate. Likewise, written parental consent has been requested. The instruments have been applied collectively and anonymously, coding variables such as participant umber, gender, age and academic year. The average time of administration of each instrument has been: CAPS (15 minutes) and SAS (30 minutes).

Data analysis

Bivariate correlations between perfectionist dimensions and the 18 factors of the SAS are analyzed. In addition, partial correlations for each perfectionist dimension are calculated by controlling the effect of the other dimension. The magnitude of these correlations is considered small when values oscillate between .10 and .30; moderate, between .30 and .50, and large for values ≥.50 (Cohen, 1988).

The LCA is used to determine profiles of students considering their scores in SPP and SOP. It is a person-oriented approach that group individuals into categories (latent classes) according to response patterns. Statistical analyses begin with a class, which suggests a classification adjustment for all individuals. Next, individuals are successively assigned to an ascending number of classes. To determine which number of classes is the best fitted to the data, the lowest values of the Bayesian Information Criteria (BIC) and entropy values close to 1 are taken into account (Schreiber, 2017).

Once the number of child perfectionist classes is established, the inter-class differences in the scores on the 18 factors of the SAS are analyzed using the analysis of variance (ANOVA). Moreover, post hoc tests (Bonferroni method) are carried out to identify between which groups there are statistically significant differences, as well as using Cohen's *d* index to calculate the effect size of the observed differences. Specifically, *d* levels between 0.20 and 0.49 indicate a small effect magnitude; between 0.50 and 0.79 indicate a moderate magnitude; and ≥0.80, a large one (Cohen, 1988).

Results

Bivariate and partial correlations

As observed in Table 1, positive and statistically significant bivariate correlations were found between SOP and *success/ability* and *success/effort* in Maths and in the total score of the SAS, as

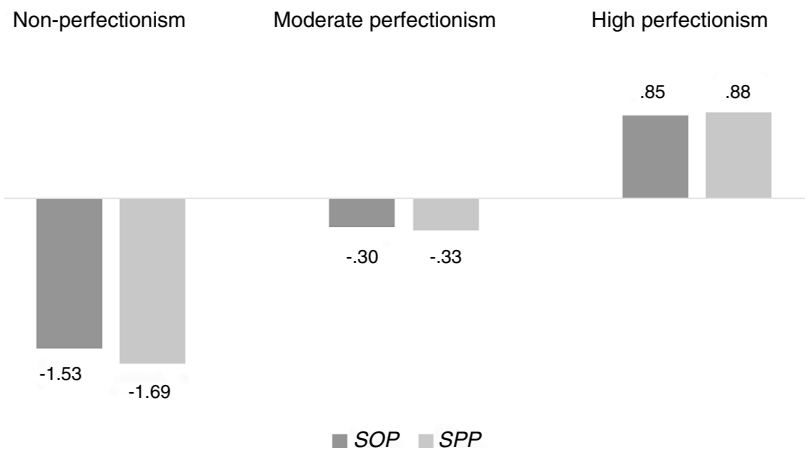

Figure 1. Graphical representation of standardized mean scores for the model of three latent classes.

Table 2
Fit indexes of the results of the LCA

Account of classes	*BIC*	Entropy
2 classes	2327.59	.60
3 classes	**2285.67**	**.67**
4 classes	2289.08	.63
5 classes	2305.70	.68
6 classes	2331.16	.61

Note. Values in bold show the best model fit.

well as significant and negative correlations for the attributions of *success/external* in Language. Regarding failure situations, SOP significantly and positively correlated with the attributions to *failure/effort* and negatively in the case of *failure/external*.

SPP negatively and significantly correlates with the *success/external* attributions only in Language. Moreover, negative and significant correlations are obtained between SPP and *failure/external* attributions in Maths and in the total score of the SAS, as well as positive and significant correlations with *failure/ability* in Language and in the total score of the SAS, and for the *failure/effort* in Language, Maths and the total score of the SAS.

Results of the partial correlations between each perfectionist dimension (controlling the other dimension) and causal self-attributions show positive and statistically significant correlations between SOP and *success/ability* and *success/effort* self-attributions, as well as with *failure/effort*, only in the area of Language. On the contrary, in situations of failure, SOP is negatively and significantly linked with self-attributions to external causes.

Regarding the results for the SPP dimension, controlling the SOP, negatively and statistically significant correlations are obtained with the self-attributions of *success/effort* in Language and in the total score of the SAS; as well as in the *success/ability* factor in Maths and in the total score. Finally, in situations of failure, SPP only positively correlates with the self-attributions to the lack of effort in Maths.

Latent class analysis

Table 2 presents the adjustment obtained for each model from two to six classes. The three-class model obtains the lowest BIC value. However, the five-class model presents the highest entropy value. Since the BIC is the best indicator of the number of classes (Nylund, Asparouhov, & Muthén, 2007), if a model meeting both adjustment criteria is not found, i.e., lower value of BIC and higher entropy, the class solution presenting the lowest BIC is selected (e.g., Moate et al., 2016; Sironic & Reeve, 2015; Suh, Gnilka, & Rice, 2017).

Regarding the classification utility, the solution of three classes includes three groups of perfectionists: the first group classifies 47 (10.90%) students with low scores in both SPP and SOP. For this reason, it is called *non-perfectionism*. The second group consists of 269 (62.41%) students with moderate scores in SPP and SOP, categorized as *moderate perfectionism*. Finally, the third group includes 115 (26.68%) participants with high scores on SPP and SOP, being considered as *high perfectionism* (see Figure 1).

On the other hand, the solution of five classes includes five groups characterized by (a) high levels of perfectionism, (b) very low levels of perfectionism, (c) low levels of perfectionism, (d) moderate levels of perfectionism, and (e) high levels of SPP and low levels of SOP. It should be mentioned that this last group only includes four participants. Therefore, it is considered that the three-class model presents a greater classificatory utility and interpretability, as well as being the model with the best fit indexes considering the BIC and entropy values together.

Inter-class differences

Statistically significant inter-class differences have been only obtained in the *success/external* factors in Language and the total score, as well as in the *failure/effort* and *failure/external* factors in both Language and Maths and in the total score of the SAS (see Table 3).

Post hoc comparisons (see Table 4) show that *high perfectionism* scores significantly lower than *non-perfectionism* in the factor *success/external* in Language. On the contrary, both groups, *high perfectionism* and *moderate perfectionism*, compared to the *non-perfectionism* group score statistically and significantly lower on the *failure/external* factor, as well as statistically and significantly higher on the *failure/effort* factor for the Language and Maths areas and in the SAS general score. Effect sizes associated with these differences are of a moderate magnitude (d = between 0.54 and 0.75) in all cases, except in the differences for *failure/external* in Language between *non-perfectionism* and *moderate perfectionism* groups (d_Y = 0.44), and *success/external* between *non-perfectionism* and *high perfectionism* (d_Y = 0.46).

Discussion

The aim of this study is to analyze the relationship between perfectionism and academic causal self-attributions during childhood through a double perspective: person-oriented and variable-oriented.

Table 3
Mean scores, standard deviations and post hoc contrasts obtained by the perfectionist profiles on causal self-attributions

Variable		Non-perfectionism		Moderate perfectionism		High perfectionism		Statistical significance and effect sizes		
		M	*SD*	*M*	*SD*	*M*	*SD*	$F_{(2, 428)}$	*p*	η^2
Language	S/A	3.04	1.21	3.27	1.18	3.27	1.25	.76	.47	.00
	S/E	3.22	1.06	3.42	1.02	3.37	1.04	.74	.48	.00
	S/Ex	4.44	1.00	4.06	.97	3.83	1.13	5.75	.00	.03
	F/A	.89	.99	1.25	1.10	1.36	1.26	2.60	.08	.01
	F/E	1.08	.97	1.67	1.01	1.83	1.08	8.27	.00	.04
	F/Ex	4.80	.92	4.37	.99	4.27	1.01	4.50	.01	.02
Maths	S/A	2.47	1.34	2.75	1.21	2.98	1.25	2.83	.06	.01
	S/E	3.13	1.13	3.26	1.01	3.90	.99	.40	.67	.00
	S/Ex	4.08	1.03	3.74	1.03	3.81	1.01	2.10	.12	.01
	F/A	1.05	1.21	1.47	1.11	1.35	1.16	2.63	.07	.01
	F/E	1.19	1.10	1.85	.99	1.97	1.11	9.06	.00	.04
	F/Ex	4.78	.92	4.22	.96	4.12	.94	7.82	.00	.04
Total	S/A	5.50	2.28	6.01	2.00	6.24	2.09	1.97	.14	.01
	S/E	6.35	2.10	6.68	1.89	6.67	1.85	.56	.57	.00
	S/Ex	8.52	1.81	7.79	1.81	7.63	1.98	3.57	.03	.02
	F/A	1.94	2.04	2.72	1.96	2.71	2.16	2.80	.06	.01
	F/E	2.26	2.01	3.52	1.86	3.79	2.04	9.83	.00	.04
	F/Ex	9.58	1.77	8.59	1.83	8.38	1.80	6.84	.00	.03

Note. F/A: failure/ability, F/E: failure/effort, F/Ex: failure/external, S/A: success/ability, S/E: success/effort, S/Ex: success/external.

Table 4
Cohen's *d* indexes for post hoc contrasts between the mean scores obtained by the three classes on causal attributions

		Moderate perfectionism vs high perfectionism	Moderate perfectionism vs non-perfectionism	High perfectionism vs non-perfectionism
Language	S/Ex	–	–	.56
	F/E	–	.59	.71
	F/Ex	–	.44	.54
Mathematics	F/E	–	.66	.70
	F/Ex	–	.59	.71
Total	S/Ex	–	–	.46
	F/E	–	.67	.75
	F/Ex	–	.54	.67

Note. F/E: failure/effort, F/Ex: failure/external, S/Ex: success/external.

First of all, results from LCA allow observing the existence of three profiles of perfectionist students with high, moderate and low levels in both perfectionist dimensions. This model of three classes does not coincide with any previous study. However, this is not an unexpected result taking into account that studies conducted in children have used clustering methods different than LCA (e.g., Inglés et al., 2016; Vicent et al., 2017), except the work of Herman et al. (2011), in which case, the differences could be explained due to the measurement instrument used, as well as the differences in the sample, since Herman et al. (2011) employ a sample of African-American 6th grade students.

Likewise, the model of three classes obtained in this study questions the two factors theory of perfectionism, one adaptive (e.g., SOP) and another maladaptive (e.g., SPP). It also warns about the need to analyze the impact that both dimensions have on the person, instead of only focusing on the differential correlation patterns offered by SOP and SPP with other adjustment or maladaptive measures. This is because, as suggested by the profiles found in the present study, perfectionist facets are not separable in lived experience, usually being manifested jointly in people (Greenspon, 2014; Lundh et al., 2008).

In addition, most of the significant inter-class differences are found in academic self-attributions in situations of failure. Specifically, students with *high* and *moderate perfectionism* attribute their failures to a greater extent to the lack of effort, as well as to a lesser extent to external causes, compared with *non-perfectionism*, not only in Language and Maths, but also in the total score of the SAS.

Following Stoeber's (2017) recommendations, the shared (bivariate correlations) and unique (partial correlations) relationships between perfectionist dimensions (SOP and SPP) and academic causal self-attributions have been analyzed, in order to find to what extent these differences can be explained by SOP or SPP. Bivariate correlations allow understanding why an individual with high levels in one of the perfectionist dimensions differs or not from another individual with low levels in the same perfectionist dimension. On the other hand, partial correlations must be interpreted in terms of keeping a perfectionist dimension statistically constant when the relationships of the other is examined (Stoeber & Gaudreau, 2017; Stoeber, Noland, Mawenu, Henderson, & Kent, 2017). In this sense, positive and statistically significant bivariate correlations are obtained between both perfectionist dimensions and self-attributions of failures to lack of effort, which explains why students with low levels in SOP and SPP (*non-perfectionism* profile) score significantly lower in this type of attributions. However, the results of partial correlation analysis suggest that these differences between profiles are explained by SOP in the Language area and by SPP in Maths, as well as by the superposition of both dimensions. In the case of self-attributions of failure to external causes, the correlation coefficients found indicate that the inter-group differences are explained especially by the negative relationship that exists between SOP and this type of causal attributions. Likewise, in the case of Maths and the total scores of the SAS, these differences would also be justified, in addition to the unique SOP relationships, for their influence on the SPP.

At the same time, in situations of academic success, statistically significant inter-class differences are only found in self-attributions to external causes in Language and in the total scores of the SAS. Specifically, it has been obtained that *high perfectionism* scores significantly lower than *non-perfectionism*. In this case, significant and negative bivariate correlations are observed between both

perfectionist dimensions and the attribution of success to external causes in Language. However, the partial correlations are not significant, which indicates that the differences between profiles for the self-attributions of the successes to external causes are due to the overlap of SOP and SPP. That is, an individual may obtain lower scores than another in the self-attributions of successes to external causes, as long as they manifest higher levels in the two perfectionist dimensions.

In summary, the results of this study show a tendency of those children with high levels of perfectionism to attribute their failures to the lack of effort, to a greater extent, and both failures and successes to external causes, to a lesser extent. These results partially coincide with previous literature that found a positive relationship between perfectionism and internal type attributions (Anshel & Mansouri, 2005; Blankstein & Winkworth, 2004; Li et al., 2015; Neumeister, 2004). However, results of this research contradict other previous studies that found that perfectionism tends to be linked to external causal attributions (e.g., Flett et al., 1998; Levine et al., 2017). These divergences between this study and previous literature could be explained due to the characteristics of the sample, such as age and culture, as well as the type of analysis and the approach (i.e., variable-oriented used), since no previous study has examined the relationship between perfectionism and causal attributions in children, in Spanish population and/or using a person-oriented approach.

These results indicate a tendency in students with high levels of perfectionism to take responsibility for their successes and failures, attributing them, to a lesser extent, to external causes such as luck or the difficulty of the task, as well as to consider that when they fail, it is due to the lack of effort. This attributional profile is considered adaptive since the subject tends to attribute their results to causes that they can control, and, therefore, modify. It means leaving aside causal explanations that are beyond their control, such as luck or the complexity of the task which could trigger in a state of learned helplessness (Försterling, 1985, cited in Bueno-Álvarez, 1995). However, it should be remembered that when a student considers that their failure is due to the lack of effort, a series of emotional consequences are triggered (Weiner, 2014). Thus, they could be more exacerbated in the case of perfectionist children. In this line, Hewitt, Flett, and Mikail (2017) indicate that, when perfectionist children fail, they feel intense guilt, self-criticism and aversive emotions, including shame, remorse and depression, that is, various forms of self-punishment. In addition, these children tend to experience failure more frequently since they have a biased view of the successes and mistakes that make them to interpret their results in absolute terms (Egan, Piek, Dyck, & Rees, 2007). Therefore, students with a high perfectionism profile, which supposes more than 25% of the child population according to the data of our study, could present certain psychological vulnerability after repeated failures (e.g. Stoeber et al., 2014). Consequently, it is advisable that teachers and school psychologist administer strategies in the school aimed at helping students with high levels of perfectionism to interpret their successes and failures realistically and to develop the self-compassion and resilience necessary to counteract self-criticism and maintain positive expectations about their future performance.

Despite the contributions of this work, there are several limitations that should be considered. First, data has been collected through self-reports, so they could be biased due to a social desirability effect. Likewise, it would be convenient to check if the results of the class analysis is maintained using other measures of child perfectionism. Second, this study has not used any exclusion criteria regarding the ethnic composition of the sample. Although the percentage of participants identified as non-Spanish has been small (8.58%), it is necessary to take into account the existence of possible cultural differences that affect the way in which perfectionism is linked to other variables (e.g., Dibartolo & Rendón, 2012). In this sense, not only should the generalization of the results found be examined in other types of samples (i.e., clinical population or other ethnic groups), but it should also be analyzed in other types of contexts (i.e., sports, work, social, etc.). Finally, this study allows understanding the relationship between perfectionism and academic self-attributions. However, the cross-sectional design prevents from concluding that perfectionism causes certain attributional patterns. In this sense, it would be interesting to incorporate longitudinal data that would allow verifying the trajectories of each perfectionist profile throughout the various educational stages.

Funding

This manuscript was supported by the Ministry of Economy and Competitiveness of Spain with the project awarded to José Manuel García Fernández (EDU2012-35124), as well as by the VALi+d Program granted to María Vicent (ACIF/2014/368).

References

Alonso-Tapia, J. (1984). Atribución de la causalidad y motivación de logro desde una perspectiva evolutiva. Evidencia empírica. *Infancia y Aprendizaje*, *26*, 30–46.

Anshel, M. H., & Mansouri, H. (2005). Influences of perfectionism on motor performance, affect, and causal attributions in responses to critical information feedback. *Journal of Sport Behavior*, *28*(2), 99–124.

Bieling, P. J., Israeli, A., Smith, J., & Antony, M. M. (2003). Making the grade: The behavioral consequences of perfectionism in the classroom. *Personality and Individual Differences*, *35*(1), 163–178. http://dx.doi.org/10.1016/S0191-8869(02)00173-3

Blankstein, K. R., & Winkworth, G. R. (2004). Dimensions of perfectionism and levels of attributions for grades: Relations with dysphoria and academic performance. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *22*(4), 271–299. http://dx.doi.org/10.1023/B:JORE.0000047312.20212.30

Brown, E. J., Heimberg, R. G., Frost, R. O., Makris, G. S., Juster, H. R., & Leung, A. W. (1999). Relationship of perfectionism to affect, expectations, attributions, and performance in the classroom. *Journal of Social and Clinical Psychology*, *18*, 98–120. http://dx.doi.org/10.1521/jscp.1999.18.1.98

Bueno-Álvarez, J. B. (1995). Motivación: programas de intervención. In J. Beltrán-Llera, & J. A. Bueno-Álvarez (Eds.), *Psicología de la educación* (pp. 256–286). Barcelona: Marcombo.

Castro, J. F., Gila, A., Gual, P., Lahortiga, F., Saura, B., & Toro, J. (2004). Perfectionism dimensions in children and adolescents with anorexia nervosa. *Journal of Adolescent Health*, *35*(5), 392–398. http://dx.doi.org/10.1016/j.jadohealth.2003.11.094

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.

Dibartolo, P., & Rendón, M. J. (2012). A critical examination of the construct of perfectionism and its relationship to mental health in Asian and African Americans using a cross-cultural framework. *Clinical Psychology Review*, *32*(3), 139–152. http://dx.doi.org/10.1016/j.cpr.2011.09.007

Egan, S. J., Piek, J. P., Dyck, M. J., & Rees, C. S. (2007). The role of dicotomous thinking and rigidity in perfectionism. *Behavior Research and Therapy*, *45*, 1813–1822. http://dx.doi.org/10.1016/j.brat.2007.02.002

Egan, S. J., Piek, J. P., Dyck, J. D., Rees, C. S., & Hagger, M. S. (2013). A clinical investigation of motivation to change standards and cognitions about failure in perfectionism. *Behavioral and Cognitive Psychotherapy*, *41*, 565–578. http://dx.doi.org/10.1017/S135246581200063X

Flett, G. L., Hewitt, P. L., Besser, A., Su, C., Vaillancourt, T., Boucher, D., ... & Gale, O. (2016). The Child-Adolescent Perfectionism Scale: Development, psychometric properties, and associations with stress, distress, and psychiatric symptoms. *Journal of Psychoeducational Assessment*, *34*(7), 634–652. http://dx.doi.org/10.1177/0734282916651381

Flett, G. L., Hewitt, P. L., Blankstein, K. R., & Pickering, D. (1998). Perfectionism in relation to attributions for success of failure. *Current Psychology*, *17*(2/3), 249–262. http://dx.doi.org/10.1080/00207590701403850

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, *14*, 449–468. http://dx.doi.org/10.1007/BF01172967

Gaudreau, P., & Thompson, A. (2010). Testing a 2×2 model of dispositional perfectionism. *Personality and Individual Differences*, *48*, 532–537. http://dx.doi.org/10.1016/j.paid.2009.11.031

González-Pumariega, S., Núñez, J. C., & González-Pienda, J. A. (1996). Atribuciones causales en alumnos con y sin dificultades de aprendizaje. *Magister*, *14*, 217–244.

Graham, S., & Taylor, A. Z. (2016). Attribution theory and motivation in school. In K. Wentzel, & D. B. Miele (Eds.), *Handbook of motivation at school* (pp. 11–33). London and New York: Routledge.

Greenspon, T. S. (2014). Is there an antidote to perfectionism? *Psychology in the Schools*, *51*(9), 986–998. http://dx.doi.org/10.1002/pits.21797

Gulliford, A., & Miller, A. (2015). Raising educational achievement: What can instructional psychology contribute? In T. Cline, A. Gulliford, & S. Birch (Eds.), *Educational psychology* (pp. 83–107). London and New York: Routledge.

Herman, K. C., Trotter, R., Reinke, W. M., & Ialongo, N. (2011). Developmental origins of perfectionism among African American youth. *Journal of Counseling Psychology*, *58*(3), 321–334. http://dx.doi.org/10.1037/a0023108

Hewitt, P. L., Flett, G. L., & Mikail, S. F. (2017). *Perfectionism: A relational approach to conceptualization, assessment and treatment*. New York: The Guildford Press.

Hong, R. Y., Lee, S. S. M., Chng, R. Z., Zhou, Y., Tsai, F., & Tan, S. H. (2017). Developmental trajectories of maladaptive perfectionism in middle childhood. *Journal of Personality*, *85*(3), 409–422. http://dx.doi.org/10.1111/jopy.12249

Inglés, C. J., García-Fernández, J. M., Vicent, M., Gonzálvez, C., & Sanmartín, R. (2016). Profiles of perfectionism and school anxiety: A review of 2 × 2 model of dispositional perfectionism in child population. *Frontiers in Psychology*, *14*(7), 1–11. http://dx.doi.org/10.3389/fpsyg.2016.01403

Levine, S. L., Werner, K. M., Capaldi, J. S., & Milyavskaya, M. (2017). Let's play the blame game: The distinct effects of personal standards and self-critical perfectionism on attributions of success and failure during goal pursuit. *Journal of Research in Personality*, *71*, 57–66. http://dx.doi.org/10.1016/j.jrp.2017.08.005

Li, Y., Lan, J., & Ju, C. (2015). Achievement motivation and attributional style as mediators between perfectionism and subjective well-being in Chinese university students. *Personality and Individual Differences*, *79*, 146–151. http://dx.doi.org/10.1016/j.paid.2015.01.050

Lundh, L., Saboonchi, F., & Wangby, M. (2008). The role of personal standards in clinically significant perfectionism. A person-oriented approach to the study of patterns of perfectionism. *Cognitive Therapy and Research*, *32*, 333–350. http://dx.doi.org/10.1007/s10608 006-9109-7

Marsh, H. W. (1984). Relations among dimensions of self-attribution, dimensions of self-concept and academic achievements. *Journal of Educational Psychology*, *76*, 1291–1308. http://dx.doi.org/10.1037/0022-0663.76.6.1291

McCreary, B. T., Joiner, T. E., Schmidt, N. B., & Ialongo, N. S. (2004). The structure and correlates of perfectionism in African American children. *Journal of Clinical Child & Adolescent Psychology*, *33*(2), 313–324. http://dx.doi.org/10.1207/s15374424jccp3302_13

Moate, R. M., Gnilka, P. B., West, E. M., & Bruns, K. L. (2016). Stress and burnout among counselor educators: Differences between adaptive perfectionists, maladaptive perfectionists and nonperfectionists. *Journal of Counseling & Development*, *94*, 161–171. http://dx.doi.org/10.1002/jcad.12073

Neumeister, K. L. (2004). Interpreting successes and failures: The influence of perfectionism on perspective. *Journal for the Education of the Gifted*, *27*(4), 311–335. http://dx.doi.org/10.4219/jeg-2004-320

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*(4), 535–569. http://dx.doi.org/10.1080/10705510701575396

Perry, R. P., & Hamm, J. M. (2017). An attribution perspective on competence and motivation: Theory and treatment interventions. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation. Theory and application* (pp. 61–84). New York: The Guildford Press.

Schreiber, J. B. (2017). Latent class analysis: An example for reporting results. *Research in Social and Administrative*, *13*, 1196–1201. http://dx.doi.org/10.1016/j.sapharm.2016.11.011

Sironic, A., & Reeve, R. A. (2015). A combined analysis of the Frost Multidimensional Perfectionism Scale (FMPS), Child and Adolescent Perfectionism Scale (CAPS), and Almost Perfect Scale-Revised (APS-R): Different perfectionist profiles in adolescent high school students. *Psychological Assessment*, *27*(4), 1471–1483. http://dx.doi.org/10.1037/pas0000137

Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The revised Almost Perfect Scale. *Measurement and Evaluation in Counseling and Development*, *34*, 130–145.

Stoeber, J. (2017). The psychology of perfectionism: Critical issues, open questions and future directions. In J. Stoeber (Ed.), *The psychology of perfectionism: Theory, research, applications* (pp. 333–352). London: Routledge.

Stoeber, J., & Becker, C. (2008). Perfectionism, achievement motives, and attribution of success and failure in female soccer players. *International Journal of Psychology*, *43*(6), 980–987. http://dx.doi.org/10.1080/00207590701403850

Stoeber, J., & Gaudreau, P. (2017). The advantages of partialling perfectionistic strivings and perfectionistic concerns: Critical issues and recommendations. *Personality and Individual Differences*, *104*, 379–386. http://dx.doi.org/10.1016/j.paid.2016.08.039

Stoeber, J., Kobori, O., & Tanno, Y. (2013). Perfectionism and self-conscious emotions in British and Japanese students: Predicting pride and embarrassment after success and failure. *European Journal of Personality*, *27*, 59–70. http://dx.doi.org/10.1002/per.1858

Stoeber, J., Noland, A. B., Mawenu, T. W. N., Henderson, T. M., & Kent, D. N. P. (2017). Perfectionism, social disconnection, and interpersonal hostility: Not all perfectionists don't play nicely with others. *Personality and Individual Differences*, *119*, 112–117. http://dx.doi.org/10.1016/j.paid.2017.07.008

Stoeber, J., Schneider, N., Hussain, R., & Matthews, K. (2014). Perfectionism and negative affect after repeated failure: Anxiety, depression, and anger. *Journal of Individual Differences*, *35*(2), 87–94. http://dx.doi.org/10.1027/1614-0001/a000130

Suh, H., Gnilka, P. B., & Rice, K. G. (2017). Perfectionism and well-being: A positive psychology framework. *Personality and Individual Differences*, *111*, 25–30. http://dx.doi.org/10.1016/j.paid.2017.01.041

Vicent, M., Inglés, C. J., Sanmartín, R., Gonzálvez, C., & García-Fernández, J. M. (2017). Perfectionism and aggression: Identifying risk profiles in children. *Personality and Individual Differences*, *112*, 106–112. http://dx.doi.org/10.1016/j.paid.2017.02.061

Wang, K. T., Permyakova, T. M., & Sheveleva, M. S. (2016). Assessing perfectionism in Russia: Classifying perfectionists with the Short Almost Perfect Scale. *Personality and Individual Differences*, *92*, 174–179. http://dx.doi.org/10.1016/j.paid.2015.12.044

Weiner, B. (2010). The development of an attribution-based theory of motivation: A history of ideas. *Educational Psychologist*, *45*(1), 28–36. http://dx.doi.org/10.1080/00461520903433596

Weiner, B. (2014). The attribution approach to emotion and motivation: History, hypotheses, home runs headaches/heartaches. *Emotion Review*, *6*(4), 353–361. http://dx.doi.org/10.1177/1754073914534502