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Latent Profiles of Anxious Children and Their Differences in Aggressive Behavior

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Received: 27 June 2020; Accepted: 30 July 2020; Published: 31 July 2020

Abstract: Children tend to develop forms of anxiety that can be associated with school violence. However, the previous scientific literature on anxiety and aggression is scarce. In addition, it has only focused on examining differential relationships between both variables. This study aimed to analyze the relationships between three forms of anxiety (anticipatory anxiety, school-based performance anxiety, and generalized anxiety) and the components of aggression (physical and verbal aggression, anger, and hostility) by adopting a person-centered approach. The sample consisted of 1161 Spanish students from 8 to 11 years old (M = 9.72, SD = 1.14); 46.2% were boys. Informed written consent from the parents or legal guardians was obtained. The Visual Analogue Scale for Anxiety—Revised and the Aggression Questionnaire were used. The latent profile analysis technique identified three profiles of anxious children: Low Anxiety, High School-based Performance Anxiety, and High Anxiety. The High Anxiety group scored significantly higher than the Low Anxiety group in all components of aggression, with effect sizes ranging from moderate to large (d = 0.59 to 0.99). The High Anxiety profile showed significantly higher scores than the high school-based performance anxiety profile only in anger (d = 0.56) and hostility (d = 0.44). The results have relevant implications for practice, since there is evidence that different intervention strategies should be applied according to the risk profile.

Keywords: aggression; anxiety; childhood; latent profile analysis; Spain

1. Introduction

Child anxiety is an emotional problem, characterized by excessive fear responses to perceived threats [1]. Since children spend most of their time in school, they tend to develop forms of anxiety (e.g., social anxiety), which can be associated with difficulties in the school environment, such as conduct problems [2]. Thus, there is currently growing scientific interest in school violence [3], which is focusing on the relationship between anxiety and aggression [4,5] and going beyond the traditional study of the association between anxiety and inhibitory behavior [6].

Aggression is commonly defined as an observable behavior that is carried out with the intention of injuring a victim, who tends to prevent such harm [7]. Physical aggression (i.e., any physical behavior, such as a hit or a kick, which is carried out in order to do harm) and verbal aggression (i.e., any verbal action, such as an insult or a yell, which has the intent to injure another individual) are the most frequently identified forms of aggression [8]. However, aggression can be defined considering multiple forms and components. In this sense, the study of this behavior has provided conceptualizations that consider aggression as a construct involving physical, verbal, and psychological forms, being the model of Buss and Perry [9] "an influential framework that emphasized the importance of individual differences and psychological functioning" [10] (p. 3). This model determined that

aggressive behavior is not only made up of a motor component, which includes physical and verbal aggression, but also an emotional component (anger) and a cognitive component (hostility). Anger is understood as an emotional response to situations perceived as threatening, with a variable intensity from irritation to fury [11,12]. Hostility is a cognitive state that involves negative evaluations towards others (e.g., distrust) [13].

The components of aggression experienced in childhood can persist in adolescence and adulthood. Therefore, intervention programs that teach children alternatives to aggressive behavior must be implemented [14]. In addition, gender differences must be considered, since a review of scientific literature has identified that boys generally tend to manifest aggressive behavior to a greater extent than girls. Specifically, boys tend to show more physical aggression than girls [15]. According to Granic [16], there are many prevention and treatment programs based on developmental theories of aggression, which have proven to be only moderately effective. These results may be because the high comorbidity between child aggression and anxiety is ignored both in explanatory models of aggression and in intervention programs [16,17]. Consequently, it is of great interest to analyze the relationship between forms of anxiety and the components of aggression to design interventions adapted to the complexity of symptoms experienced by students.

1.1. Anxiety and Aggression

Several studies have examined the association between forms of anxiety and the components of aggression. Most of these works focused on anxiety disorders; specifically, on generalized anxiety disorder (GAD) and social anxiety disorder (SAD). Regarding GAD, a positive and significant relationship with anger and hostility was found [18–20]. As regards SAD, several works also identified a positive and significant association with anger and hostility [18,20–23]. However, there is evidence that SAD positively and significantly correlates with submission (i.e., giving in and accepting the attribution of blame made by others) and self-criticism [24,25]. Therefore, there is no empirical consensus; SAD could be mostly associated either with anger and hostility or with submission and self-criticism. Regarding the motor component of aggression, some studies suggested that SAD is negatively and significantly associated with aggressive behavior [23,26] and verbal aggression [21]. With regard to the sample's characteristics, except for one study that used a child population [26], all of them recruited university students or adults. In the second place, except for three works that used clinical samples, with participants diagnosed with some anxiety disorder [21,24,26], all of them focused on community samples. Finally, it should be noted that most of these studies were conducted in American and Canadian population.

In the same vein, the relationship between school anxiety and the components of aggression has been analyzed. The first research was carried out by using a sample of 898 Chilean adolescents aged between 12 and 17 years (M = 15.44, SD = 1.26) [27]. It was found that male participants with high levels of physical aggression, verbal aggression, anger, and hostility, compared to those with low levels, scored significantly higher on school anxiety. Later, with 1131 Chilean adolescents aged 13 to 18 (M = 15.30, SD = 1.10), it was obtained that high levels of anger predicted high levels of school anxiety [28].

The review of previous research examining the relationship between forms of anxiety and the components of aggression has shown, first, that the Buss and Perry [9] model has been used in a few studies. Thus, only three works [19,21,27] considered the components of aggressive behavior: physical and verbal aggression, anger, and hostility. Secondly, anxiety disorders and school anxiety have been analyzed, but these studies have not addressed forms of anxiety developed in the school setting to understand its possible relationship with aggressive behavior. Thirdly, only one study [26] used a child sample, but this was a clinical sample, since the participants had been diagnosed with SAD. Likewise, no work has been conducted in the Spanish population, even though conduct problems are becoming more frequent in Spanish schools [29]. Consequently, it is necessary to study the association between forms of anxiety and the components of aggression in a community sample of Spanish children. Unlike

all previous research analyzing differential relationships between both anxiety and aggression variables, it is convenient to adopt a person-centered approach to get closer to the participants' reality [30]. In this sense, it could be verified whether there are different subpopulations of children with the same profile of intensity of anxious symptoms, since the person-centered approach is focused on subgroups of people characterized by unobservable heterogeneity and not on the variables. This is statistically based on the latent class analysis (LCA) or latent profile analysis (LPA) method. Finally, the possible differential associations of anxiety profiles with the components of aggression could be examined.

1.2. Profiles of Anxious Children

The study of anxiety profiles in the Spanish children population is reduced to two works in the literature. Both shared the use of the Spanish version of the Visual Analogue Scale for Anxiety—Revised (VAA-R) [31]. The peculiarity of this scale is that it allows for differentiation between generalized anxiety (GA) and forms of anxiety developed in the school setting: anticipatory anxiety (AA) and school-based performance anxiety (SA). The first study of anxious profiles from the VAA-R recruited a sample of 911 students aged between 8 and 12 years (M = 9.61, SD = 1.23) and used the non-hierarchical method K-means [31]. The second one recruited 1287 participants aged 8 to 11 (M = 9.68, SD = 1.20) and used LCA [32]. Both studies obtained a similar four-cluster solution characterized by a specific group of anxiety in the school setting: High Anxiety School-type [31] or Low Anxiety School-type [32], and three less specific groups: High Anxiety, Moderate Anxiety, and Low Anxiety [31,32]. The Anxiety School-type group showed a different pattern in AA and SA scores, which were referred to as anxiety in the school setting, than in GA scores. The remaining three groups showed the same pattern in AA, SA, and GA scores.

At the international level, two studies have examined child anxiety profiles. Specifically, both assessed three forms of anxiety: test anxiety, mathematics anxiety, and general anxiety. The first work used two samples of students from United Kingdom [33]. Four classes were found in 817 children aged between 8 and 9 years (M = 109.4 months, SD = 3.7 months): Low Anxiety, Slight Anxiety, Moderate Anxiety, and High Anxiety. More specific classes were identified with 903 students aged 11 to 13 (M = 148.0 months, SD = 4.0 months): High Anxiety, General Anxiety, Academic Anxiety (i.e., test anxiety and mathematics anxiety), and Low Anxiety. The second study recruited 664 students (M_{age} = 9.20, SD = 1.13) from Italy, who were enrolled in the 3rd to 6th grades of primary education [34]. In this case, three profiles were found: High Risk, Average Risk, and Low Risk.

1.3. Research Objectives and Hypotheses

Hypothesis 1 (H1). *To address the aforementioned limitations, this study aims to examine the relationship between forms of anxiety and the components of aggression in a sample of Spanish primary education students. For achieving this goal, a person-centered approach will be used. Specifically, LPA will be performed on the VAA-R to check whether the combinations of AA, SA, and GA scores give rise to different profiles of anxious children. Taking as reference the four-cluster solutions from the VAA-R previously identified in Spanish child population [31,32], it is expected to find a model of four anxiety profiles: a specific profile of anxiety in the school setting (i.e., AA and SA) and the remaining three profiles called High Anxiety, Moderate Anxiety, and Low Anxiety (i.e., AA, SA, and GA).*

Hypothesis 2 (H2). *Moreover, an attempt will be made to establish possible statistically significant differences between the anxious profiles identified and the scores in the components of aggressive behavior: physical and verbal aggression, anger, and hostility. Given that previous studies suggest a positive and significant relationship between GAD or school anxietSy and all or some of the components of aggression [18–20,27,28], it is expected that the profile with the highest levels of GA and anxiety in the school setting (i.e., AA and SA) will obtain significantly higher scores in physical aggression, verbal aggression, anger, and hostility.*

2. Materials and Methods

2.1. Participants

A multi-stage random cluster sampling was used for recruiting the participants of this study. The primary units were the geographical areas of the provinces of Murcia and Alicante (Spain): central, north, south, east, and west. The secondary units were the educational centers. Specifically, one or two schools were selected in each area, with 16 the total number of private and public centers chosen. The tertiary units were the groups of students; four classrooms were randomly selected from each educational center, one for each grade from 3rd to 6th of primary education in this country.

The initial sample consisted of 1278 participants. However, 33 (2.58%) were excluded because their parents did not give informed consent to participate, 39 (3.05%) because they completed the questionnaires with errors or omissions, and 45 (3.52%) because they had not achieved the minimum reading comprehension level required. Thus, the final sample was composed of 1161 primary education students between 8 and 11 years old (M = 9.72, SD = 1.14). Table 1 shows the frequency distribution by gender and age. No statistically significant differences were found according to gender × age ($\chi^2_{(3)} = 4.95$; $p = 0.18$). Therefore, the sample showed a uniform distribution.

Table 1. Sample distribution by gender and age.

Gender	Age				Total
	8	9	10	11	
Boys (%)	90 (7.8%)	141 (12.1%)	96 (8.3%)	209 (18%)	536 (46.2%)
Girls (%)	129 (11.1%)	162 (13.9%)	123 (10.6%)	211 (18.2%)	625 (53.8%)
Total	219 (18.9%)	303 (26%)	219 (18.9%)	420 (36.2%)	1161 (100%)

As for the sociocultural context, it was assessed according to the parents' level of academic qualification: school graduate (3.91% of the fathers and 4.32% of the mothers), mid- and upper-level vocational training or baccalaureate (35.81% of the fathers and 30.64% of the mothers), and university studies (11.96% of the fathers and 8.34% of the mothers). The remaining percentage of fathers and mothers did not provide this information. Regarding family structure, 70.34% of the participants lived with married parents, 10.12% lived with divorced or separated parents, 1.98% lived in single-parent families, and the remaining percentage did not provide this type of information.

2.2. Measures

2.2.1. Anxiety

Anxiety was assessed using the Visual Analogue Scale for Anxiety—Revised (VAA-R) by Bernstein and Garfinkel [35]. Specifically, the Spanish version of the VAA-R [31] was administered to the participants of this research. It is composed of 11 items that measure the three forms of anxiety named in the introduction: anticipatory anxiety (AA), whose five items assess situations prior to arrival at school that can provoke anxiety e.g., "Thinking about going to school on Monday"; school-based performance anxiety (SA), with three items that assess social situations that occur within the school e.g., "Being called on by the teacher"; and generalized anxiety (GA), which includes three items referring to anxious symptoms related to GAD e.g., "How I feel most of the time". Its visual response scale consists of 10 points (steady vs. nervous). Cronbach's α coefficients of the Spanish version range from 0.70 (GA) to 0.87 (AA) [31]. In this study, adequate internal consistency indices also were obtained: α = 0.85 (AA), 0.75 (SA), and 0.71 (GA).

2.2.2. Aggression

Aggressive behavior was measured with the Aggression Questionnaire (AQ) by Buss and Perry [9]. The AQ is a self-report measure of 29 items, which assesses four components of aggression: physical

aggression (nine items; e.g., "If I am provoked enough, I may hit another person"), verbal aggression (five items; e.g., "When people don't agree with me, I can't help arguing with them"), anger (seven items; e.g., "Sometimes I feel like a bomb about to explode"), and hostility (eight items; e.g., "When people are specially friendly, I wonder what they want"). A five-point Likert scale (1 = uncharacteristic of me; 5 = very characteristic of me) is used for responding to each item. The Spanish version of the questionnaire [36], whose Cronbach's α coefficients range from 0.65 (anger) to 0.80 (physical aggression), was administered in this study. Acceptable reliability values were obtained in this research: $\alpha = 0.82$ (physical aggression), 0.77 (verbal aggression), 0.72 (anger), and 0.77 (hostility).

2.3. Procedure

Firstly, the management team of each school was interviewed. In this meeting, the objectives of the research were explained, and their permission was requested. Secondly, the parents or legal guardians of the participants were informed about the objectives and characteristics of the study. Then, their written consent was obtained. The VAA-R and the AQ were collectively administered during school hours. Specifically, a 35-min session was held in the ordinary classroom (five minutes orientations, 10 min the VAA-R, and 20 min the AQ). A research team member was present in all sessions to explain the instructions, clarify doubts that may arise during the procedure, and ensure that the completion of the self-report measures was independent (i.e., the participants did not talk to each other). In addition, the students were informed that the participation was voluntary and that anonymity was guaranteed. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of the University of Alicante (UA-2017-09-05).

2.4. Statistical Analyses

In the first place, the correlations between the factors of the VAA-R and the dimensions of the AQ were analyzed. The effect sizes of statistical significance of these correlations were interpreted according to the following criteria: small when values were between 0.10 and 0.29, moderate between 0.30 and 0.49, and large ≥ 0.50 [37]. In the second place, LPA was performed to identify groups of anxious children by using the standardized z scores [38] obtained in the three factors of the VAA-R. The optimal number of latent profiles was determined by these fit indices: Bayesian information criteria (BIC), Akaike information criteria (AIC), entropy, and statistical significance. In this sense, the model with the lowest BIC and AIC values was considered to have the greatest explanatory power. In addition, entropy values closer to 1 report a greater precision of the latent profile classification [39]. Once the optimal model was identified according to statistical data (i.e., BIC, AIC, entropy, and the p-value), the profiles of that model were examined in comparison with the remaining solutions obtained. In this way, it was possible to verify whether the sample was represented through all the groups (i.e., profiles must not have less than 25 cases classified) and whether the groups could be interpreted considering the previous scientific literature [40,41]. Regarding the technique, although K-means and LCA have been widely used to identify profiles, these are currently being replaced by LPA. LPA is a variant of LCA that classifies participants into profiles based on their responses for continuous variables, or for categorical and continuous variables according with the person-centered approach [42].

After determining the anxiety profiles in childhood, the differences among the anxious groups in the mean scores of the components of aggression were examined for the total sample and for boys and girls by a multivariate analysis of variance (MANOVA). Eta square was used to stablish the magnitude of effect. Subsequently, post hoc tests (Bonferroni method) were conducted to identify among which groups there were statistically significant differences. The effect size was calculated using the Cohen's d index to find the magnitude of these differences. Specifically, the effect size is considered small when d levels are between 0.20 and 0.49, moderate between 0.50 and 0.79, and large ≥ 0.80 [37].

For these statistical analyses, MPlus, version 8 [43] and SPSS, version 26.0 [44] were used.

3. Results

3.1. Correlations between Anxiety and Aggression

Positive significant correlations ($p < 0.001$) were identified between all the factors of the VAA-R and all the dimensions of the AQ (see Table 2). The effect size of statistical significance of these correlations was small, except for the correlation between AA and hostility, where the magnitude was moderate.

Table 2. Correlations between the factors of the Visual Analogue Scale for Anxiety—Revised (VAA-R) and the dimensions of the Aggression Questionnaire (AQ).

	AA	SA	GA
Physical A.	0.21 **	0.20 **	0.16 **
Verbal A.	0.29 **	0.26 **	0.24 **
Anger	0.27 **	0.27 **	0.22 **
Hostility	0.30 **	0.28 **	0.23 **

Note: ** $p < 0.001$, AA = anticipatory anxiety, SA = school-based performance anxiety, GA = generalized anxiety, Physical A. = physical aggression, Verbal A. = verbal aggression.

3.2. Child Anxiety Profiles

Four different models with a progressive number of profiles (two through five) were tested. Table 3 shows the fit indices that were obtained for each model. The AIC and BIC values decreased as each model increased one profile. However, a tendency to stabilize was observed in these values from the three-profile model. Furthermore, the highest entropy value corresponded to the three-profile model and the *p*-values showed that this model fitted the data better than the subsequent four- and five-profile models because their *p*-values were not significant. The three-profile solution also proved to be the most parsimonious, since all profiles were representative of the sample and interpretable in relation to previous empirical evidence of child anxiety. As a consequence, this model was selected to carry out the following analyses.

Table 3. Model fit indices for the four tested models with latent profile analysis (LPA).

Model	AIC	BIC	Entropy	LMR LRT *p*-Value	Adjusted LMR LRT *p*-Value	Size
2 profiles	9277.982	9227.411	0.73	0.00	0.00	0
3 profiles	**8926.748**	**8997.546**	**0.79**	**0.00**	**0.00**	**0**
4 profiles	8858.032	8949.059	0.78	0.16	0.17	0
5 profiles	8804.707	8915.962	0.78	0.41	0.42	0

Note: Boldface values indicate best-fitting model. AIC = Akaike information criteria, BIC = Bayesian information criteria, LMR = Lo-Mendell-Rubin, and LRT = Likelihood Ratio Test.

As shown in Figure 1, the first group included 609 participants (52.45%) with low scores in the three factors. This group was called Low Anxiety. The second group classified 462 participants (39.79%) with high scores in SA and moderate scores in AA and GA, so it was called High School-based Performance Anxiety. Finally, the third group, which was named High Anxiety, consisted of 90 participants (7.75%) characterized by high scores in the three factors.

3.3. Differences among the Child Anxiety Profiles in Aggression

The MANOVA compared the mean scores of each anxiety profile in the four dimensions of the AQ. As a result, statistically significant differences were found among the three anxiety profiles in all dimensions of aggression for the total sample (Lambda de Wilks = 0.87, $F_{(8,1157)} = 21.48$, $p < 0.001$, $\eta^2 = 0.07$) and also for boys (Lambda de Wilks = 0.79, $F_{(8,532)} = 16.38$, $p < 0.001$, $\eta^2 = 0.11$) and girls

(Lambda de Wilks = 0.91, $F_{(8,621)} = 7.35$, $p < 0.001$, $\eta^2 = 0.05$). The High Anxiety group obtained the highest means in the four dimensions of the AQ. In contrast, the Low Anxiety group scored the lowest means (see Table 4).

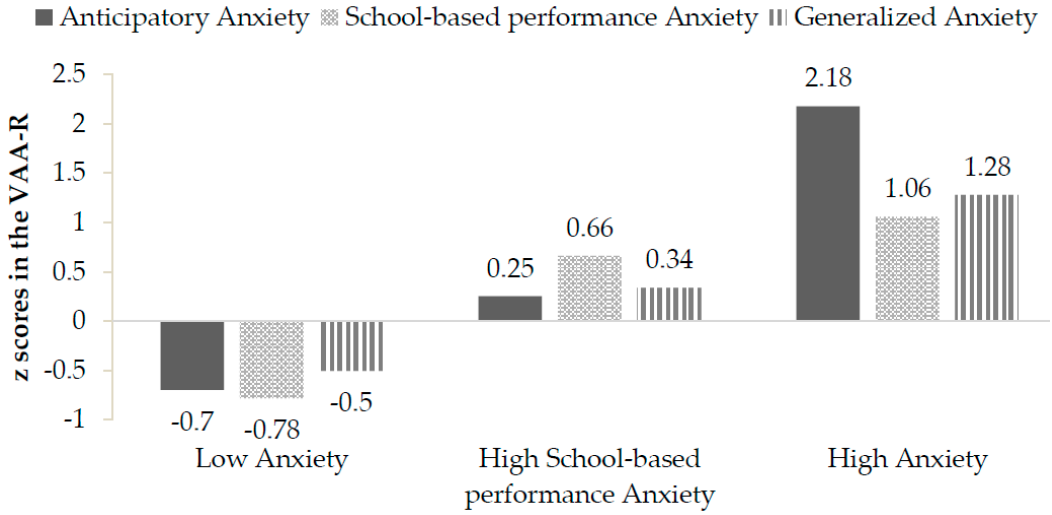

Figure 1. Graphic representation of the child anxiety profiles through latent profile analysis (LPA).

Table 4. Means, standard deviations, and post hoc contrasts between mean aggression scores obtained by the child anxiety profiles.

	AQ Dimensions	Low Anxiety		High School-Based Performance Anxiety		High Anxiety		Statistical Significance and Effect Sizes			
		M	*SD*	*M*	*SD*	*M*	*SD*	*F*	df	*p*	η^2
Total	Physical A.	17.89	7.59	20.92	7.80	22.46	8.53	27.42	1158	<0.001	0.05
	Verbal A.	9.63	3.82	12.22	4.60	12.96	5.31	59.47	1158	<0.001	0.09
	Anger	16.33	4.86	18.48	4.74	21.23	5.63	53.01	1158	<0.001	0.08
	Hostility	18.69	6.63	22.12	6.64	25.10	7.72	56.27	1158	<0.001	0.09
	Physical A.	19.20	7.64	22.79	7.86	24.80	8.93	18.06	533	<0.001	0.06
Boys	Verbal A.	9.74	3.47	12.89	4.69	13.20	5.99	38.08	533	<0.001	0.13
	Anger	16.38	4.46	18.73	5.15	22.33	5.33	35.69	533	<0.001	0.12
	Hostility	18.35	6.08	22.39	6.87	26.53	8.23	41.93	533	<0.001	0.14
	Physical A.	16.82	7.40	19.29	7.38	20.13	7.50	9.85	622	<0.001	0.03
Girls	Verbal A.	9.52	4.10	11.63	4.45	12.73	4.58	23.21	622	<0.001	0.07
	Anger	16.29	5.17	18.26	4.34	20.13	5.77	19.22	622	<0.001	0.06
	Hostility	18.98	7.04	21.88	6.43	23.66	6.96	18.23	622	<0.001	0.06

Note: Physical A. = Physical Aggression, Verbal A. = Verbal Aggression, and AQ = Aggression Questionnaire.

The post hoc tests identified between which child anxiety profiles there were statistically significant differences. Table 5 shows that the High School-based Performance Anxiety group obtained significantly higher scores than the Low Anxiety group in all dimensions of aggression, with moderate effect sizes (for verbal aggression and hostility) and small effect sizes (for physical aggression and anger). The differences between both groups also showed statistical significance for boys and girls. It should be noted that boys of the High School-based Performance Anxiety scored significantly higher in hostility than those of the Low Anxiety profile, with a moderate magnitude, while girls showed these differences with a small magnitude. In the same vein, it was observed that the High Anxiety group scored significantly higher than the Low Anxiety group in all the dimensions. However, large effect sizes were identified in this case, except for physical aggression, where a moderate effect size was found. The differences between these profiles also showed statistical significance for boys and girls. Nevertheless, boys of the High Anxiety profile obtained significantly higher scores than those of the Low Anxiety group, showing a large magnitude in verbal aggression, anger, and hostility, while girls showed

these differences with a moderate magnitude. In physical aggression, boys with High Anxiety scored significantly higher than those with Low Anxiety, showing a moderate magnitude, while for girls, the magnitude was small. Lastly, the High Anxiety group presented significantly higher scores than the High School-based Performance Anxiety group only in the dimension of anger, with a moderate effect size, and in hostility, with a small effect size. It is important to highlight that no statistically significant differences were identified between girls of these groups.

Table 5. Cohen's *d* value for post hoc contrasts between the mean scores obtained by the child anxiety profiles in the dimensions of aggression.

AQ Dimensions	Low Anxiety vs. High School-Based Performance Anxiety			Low Anxiety vs. High Anxiety			High School-Based Performance Anxiety vs. High Anxiety		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
Physical A.	0.40	0.40	0.33	0.59	0.72	0.45	-	-	-
Verbal A.	0.62	0.78	0.50	0.82	0.88	0,77	-	-	-
Anger	0.45	0.49	0.41	0.99	1.30	0,73	0.56	0.69	-
Hostility	0.52	0.63	0.43	0.95	1.27	0,67	0.44	0.58	-

Note: Physical A. = Physical Aggression, Verbal A. = Verbal Aggression, and AQ = Aggression Questionnaire.

4. Discussion

This study aimed to analyze the relationship between three forms of anxiety (AA, SA, and GA) and the components of aggressive behavior (physical and verbal aggression, anger, and hostility) in the Spanish children population. Nevertheless, apart from examining correlations between variables, a person-centered approach was used. Thus, an attempt was made to identify latent profiles of children with patterns of anxious symptoms [34]. The results revealed three profiles of anxious children: a specific profile called High School-based Performance Anxiety (i.e., SA) and the remaining two profiles named High Anxiety and Low Anxiety (i.e., AA, SA, and GA). This finding does not support the first hypothesis, since it was expected to identify a fourth profile called Moderate Anxiety (i.e., AA, SA, and GA). In addition, it was also expected to find a specific profile of anxiety in the school setting (i.e., AA and SA), but the group High School-based Performance Anxiety showed a different pattern only in SA scores. Considering that previous national studies used the same scale (i.e., VAA-R) and also recruited samples of Spanish students in the 3rd to 6th grades of primary education [31,32], the lack of consensus among the results could be due to the fact that the LPA technique has been used for the first time in this study. In this sense, "unlike traditional cluster analysis, latent profile analysis is a model-based method that fits a statistical model to the data, classifying each case (person) in the most probable group (i.e., latent class) based on responses to a set of observed variables" [45] (p. 61). LPA is considered the most appropriate method as it incorporates features that overcome limitations of traditional methods [46]. Despite not supporting previous national findings, the three-profile model follows the tendency of children in the last grades of primary education to be grouped into anxious profiles, characterized either by the same pattern of scores in all forms of anxiety or by a different pattern of scores in some form of anxiety in the school setting. In addition, this finding supports the study that identified an Academic Anxiety profile in British students aged 11 to 13 [33].

Regarding the differences among the anxious profiles in the mean scores of the components of aggression, the High Anxiety profile showed significantly higher levels of verbal aggression, anger, and hostility (with large effect sizes) and physical aggression (with a moderate effect size) than the Low Anxiety profile. These results support the second hypothesis, which postulated that the group with the highest scores in both anxiety in the school setting (i.e., AA and SA) and GA would show significantly higher levels of the components of aggression. This finding is consistent with the positive and significant correlations that have been found between the forms of anxiety and the components of aggression in this study. In the same vein, these results are consistent with previous works that reported a positive and significant association between aggressive behavior and school anxiety or

GAD [18–20,27,28]. A possible explanation for this fact is provided by the study carried out with students in the 3rd to 6th grades of elementary education in Spain [47] and Israel [48], which suggested that children who manifest aggressive behavior tend to show less self-control and more negative emotions. Furthermore, it is important to highlight that boys of the High Anxiety group also scored significantly higher than those of the Low Anxiety group in verbal aggression, anger, and hostility, with large effect sizes (while for girls, the magnitude was moderate) and in physical aggression with a moderate effect size (while for girls, the magnitude was small). This finding provides nuance to previous empirical evidences showing that boys are generally more aggressive than girls and, specifically, more physically aggressive [15]. In this sense, the present study evidences that for boys there are significantly greater differences in all components of aggression between High Anxiety and Low Anxiety groups than for girls. Therefore, special attention must be given to boys who show the High Anxiety profile.

With regard to the differences found between High Anxiety and High School-based Performance Anxiety, it should be noted that students with high scores in the three forms of anxiety analyzed (i.e., AA, SA, and GA) showed significantly higher levels of Anger and Hostility than those who only scored high in SA. The SA factor of the VAA-R is related to social anxiety, as it assesses social situations within the school that can provoke anxiety. Therefore, this result is in line with previous studies showing that people with SAD tend to be submissive and to perceive their own behavior as inappropriate [24,25]; while it is opposed to other works, which found that SAD is positively and significantly related to anger and hostility [18,20–23]. This finding supports those cognitive models that assume people with social anxiety activate self-focused cognitive processes before, during, and after social situations [49]. On the other hand, previous scientific literature suggests that there is a negative and significant relationship between SAD and the motor component of aggression [21,23,26]. In this sense, although this study has not found statistically significant differences between High Anxiety and High School-based Performance Anxiety either in physical aggression or in verbal aggression, the High School-based Performance Anxiety group obtained lower means in both dimensions than the High Anxiety group.

This study reveals that the forms of anxiety and the components of aggression analyzed have differential relationships depending on the anxiety profile shown by each student. Thus, children who manifested a profile characterized by high levels of AA, SA, and GA (approximately 8% of the sample) tended to show more anger and hostility and to be more aggressive than students with low AA, SA, and GA. Experiencing high levels of aggression in childhood carries negative consequences, such as internalizing and externalizing behavior problems (e.g., [50,51]), peer rejection, and poor academic performance (e.g., [52]). However, children whose profile was only characterized by high levels of SA (approximately 40% of the sample) reported lower levels of the three components of aggressive behavior (i.e., motor, emotional, and cognitive) than those with high AA, SA, and GA. This result is probably since students with high anxiety about social situations tend towards self-criticism and submission. Therefore, their self-esteem may be negatively affected (e.g., [53]). Considering the adverse effects of the behavioral patterns shown by the High Anxiety and High School-based Performance Anxiety profiles, it is concluded that approximately 50% of the Spanish child population examined has a risk profile.

This research has several limitations that should be considered in future studies. In the first place, this work delved into profiles of forms of anxiety in the school setting (i.e., AA and SA) and GA that Spanish primary education students can manifest. Nevertheless, the possible anxious profiles shown by secondary education students are unknown. Therefore, it is recommended to perform LPA with scores obtained by the Spanish adolescent population in the three factors of the VAA-R. In the second place, this is one of the few studies that have considered the components of aggressive behavior proposed by Buss and Perry [9] to analyze the relationship between this construct and anxiety. However, a division commonly used in the study of child aggression should be considered: proactive and reactive functions [54]. In the third place, future studies should examine the relationship between

anxiety and aggression by considering the criteria educational level of parents and family structure. Likewise, there is empirical evidence that anxiety (e.g., [55]) and aggressive behavior (e.g., [56]) differ across cultures. Since the results of this study cannot be generalized to other cultures and the previous scientific literature on anxiety and aggression is scarce, future research should verify if these findings are extendible to other countries. Finally, since the possible causal relationship between both constructs has not been examined, it is suggested that future works use the methodology of structural equations or longitudinal data.

Despite the limitations, this work provides relevant implications for educational practice. Taking as a reference the mechanisms suggested by Carey et al. [33], different intervention strategies should be used according to the risk profile manifested by each student. On the one hand, children in the High Anxiety profile may have a predisposition to all forms of anxiety (i.e., AA, SA, and GA) that leads them to show high aggressive behavior. In this case, mindfulness-based cognitive therapy could be used, as it has been proven to be effective in significantly reducing levels of anxiety and aggression in the student population [57]. This technique involves being aware of hostile thoughts and emotions (e.g., anger and anxiety). In addition, it allows the identification of signs of aggressive impulses, which are reduced as acceptance and compassion are developed [58]. In this sense, the Mindfulness-To-Meaning theory suggests that mindfulness interventions must also foster positive mental states [59]. Thus, positive psychology should be integrated into mindfulness training, since it has been proved to significantly enhance positive variables such as meaning or savoring [60]. Furthermore, it is recommended to integrate school, teachers, and families from the beginning, who should be trained to promote positive experiences and to help children to manage emotions [61,62]. On the other hand, students in the specific risk profile (i.e., High School-based Performance Anxiety) showed high scores in the items of the VAA-R referring to social situations within the school. However, they did not score high either in the items referring to situations that anticipate arrival at school or in those referring to anxiety responses related to GAD. In this case, directly intervening to develop mechanisms for facing these social situations may be more effective. In this regard, it is recommended to apply assertiveness training, as it has been proven to have a positive impact on children's self-confidence, helping them to express their position and reducing their status as submissive victims [63].

Author Contributions: Conceptualization, J.M.G.-F. and A.F.-S.; methodology, J.M.G.-F. and A.F.-S.; formal analysis, J.M.G.-F. and R.S.; investigation, J.M.G.-F., A.F.-S., R.S. and M.V.; resources, M.V.; data curation, R.S.; writing—original draft preparation, A.F.-S. and M.V.; writing—review and editing, A.F.-S., M.V., R.S. and J.M.G.-F.; supervision, J.M.G.-F. and A.F.-S.; project administration, J.M.G.-F. and A.F.-S.; funding acquisition, J.M.G.-F., A.F.-S. and M.V. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Spanish Ministry of Science and Innovation (grant number EDU2012-35124), the Ministry of Education, Culture and Sport (grant number FPU16-01386), and the University of Alicante (grant number GRE19-19).

Conflicts of Interest: The authors declare no conflict of interest.

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