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# Protective and Risk Factors for Adolescent Substance Use in Spain: Self-Esteem and Other Indicators of Personal Well-Being and Ill-Being

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**Abstract:** Although self-esteem has traditionally been considered as an important correlate of psychosocial adjustment, some empirical studies have found a positive relationship between some domains of self-esteem and drug use among adolescents. The present study analyzes self-esteem and other adjustment personal indicators as protective or risk factors for substance use. Participants were 644 Spanish adolescents aged 12–17 years. Substance use (cigarettes, alcohol, marijuana, and other illicit drugs), multidimensional self-esteem (academic, social, emotional, family, and physical), and other indicators of adolescents' well-being and ill-being (psychological problems, behavior problems, and parenting) were measured. We observed, on the one hand, that substance use had a significant negative relationship with academic, family, and physical self-esteem. On the other hand, we also observed a significant positive relationship between drug use and social self-esteem. However, this significant relationship disappeared after statistically controlling for sex and age, using both partial correlation analyses and covariance analysis. Interestingly, beyond the importance of each factor related to drugs, prevention science should first of all be able to identify whether the main psychological variables (e.g., social or physical self-esteem) are risk or protective factors for drug use.

**Keywords:** self-esteem; drug use; well-being and ill-being indicators; adolescence; full health; third variables; contradictory results

## 1. Introduction

The WHO warns about drug use as a one of the most important health problems [1]. In addition, findings from international surveys conducted in the United States and Europe revealed a greater prevalence of drug use among adolescents, which might be related to serious health problems in the short term but also to long-term adverse consequences in adulthood [2–5]. As recent studies suggest, an outdated biomedical approach to illness and disease has been evolving toward a current biopsychosocial perspective that defends the importance of psychological well-being for full health; biomedical health is necessary, but it is not enough, for full health [6,7]. Along these lines, according to the Diagnostic and Statistical Manual of Mental Disorders [8], drug use, in addition to leading to the possible development of substance-related and addictive disorders, is also an important risk factor in the onset of different mental illnesses, such as schizophrenia, depression, or bipolar disorders [9–12].

Regarding psychological factors that contribute to full health, different clinical therapists have asserted that one of the functions of drugs includes “reviving a chemically based, false and temporary boost in self-esteem” [13], p. 195. From an applied perspective, it seems easy to understand that

a person addicted to drugs would have a lower self-assessment [14,15]. Thus, among many other factors that influence human behavior, low self-esteem seems to be a common characteristic of these maladjusted behaviors and an important component, although not the only one, to improve in different psychological interventions [16–18].

Traditionally, self-esteem has been identified as an important correlate of psychosocial competence and adjustment [19–21] and, consequently, a protective factor against drug use [14,22–24]. Drug use is also negatively related to different indicators of well-being, such as family relations [25–28] or academic achievement [29,30], but it is positively related to different indicators of ill-being, such as suicide risk [31], depressed mood and distress [18,32], or delinquent behavior [33,34].

However, although the role of self-esteem as a protective factor seems to be well documented (e.g., Zimmerman, 1997) [20], a significant body of research provides empirical findings supporting the idea that self-esteem may be unnecessary or even detrimental to competence and adjustment. For example, in the study by Taylor, Davis–Kean, and Malanchuk (2007) [35], global self-esteem was not a predictor of aggression, reinforcing the findings of the works of Baumeister and his colleagues [36,37]. Schaeffer, Schuckit, and Morrissey (1976) found that self-esteem is not related to marijuana use among college students [38]. Pedersen, Hsu, Neighbors, Paves, and Larimer (2013) [39], exploring relations between self-esteem and drinking behavior in different ethnic groups of young adults, indicated that global self-esteem was positively associated with drinking in White participants but not in their Chinese/Taiwanese peers. Thus, as a function of the specific Asian ethnicity, public collective self-esteem could serve as a risk (in Korea) or, interestingly, protective factor against drinking (in China/Taiwan). In a sample of Spanish adolescents, Moreno, Moreno, and Cervello (2009) [40] found that smoking is associated with good body image (p. 187), a component of physical self-perception. Along the same lines, findings from other studies with Spanish adolescents coincide in concluding that family and academic self-esteem had a protective impact on delinquent behavior and drug use, but social and physical self-esteem had a risk impact on delinquent behavior and drug use [41–44].

These findings seriously contradict the traditional view of self-esteem as an important correlate of psychosocial adjustment [19–21]. They suggest that there are no differences between individuals with greater and poorer self-esteem in their adjustment and competence, or even adolescents who have a better self-esteem based on their social relations, more social competence and make friends easily, are, surprisingly, those who show higher levels of substance use and other indicators of ill-being. From the new broader perspective of full health, these findings raise serious doubts with important theoretical and practical implications. Is it necessary for individuals to have poor self-perceptions of their social competence (e.g., having difficulties in making new friends) in order to avoid having substance use problems? In addition, for example, do adolescents need to have lower social self-esteem in order to have greater academic and family self-esteem? If so, to what extent would it be necessary to develop family and academic self-esteem, while reducing the self-perceptions of social competence (social self-esteem), in adolescents with drug use problems?

The main objective of present study is to analyze the relations between multidimensional self-esteem and drug use, in order to examine the real or spurious relations between these variables, as well as to offer possible explanations about the inconsistencies in the research findings. Additionally, other indicators of psychosocial adjustment are included (psychological maladjustment, behavior problems, and parenting) with the aim of testing whether there are consistent relations between (i) the different well-being and ill-being indicators (whether positive or negative indicators are positively associated with each other, and whether positive indicators are inversely related to negative indicators) and (ii) the dimensions of self-esteem and the other adolescent psychosocial adjustment indicators assessed.

## 2. Materials and Methods

### 2.1. Participants and Procedure

An a priori power analysis was applied to determine the minimum sample size to detect a small effect size ( $|r| = 0.10$ , for one-tailed tests), fixing  $\alpha = 0.05$  and  $1 - \beta = 0.80$  [45–47]. The minimum required sample size in the a priori power analysis was of 614 participants. In order to obtain the planned sample, 10 schools were selected from a complete list of educational centers in a Spanish Autonomous Community. Two schools refused to participate. All the rest of the schools contacted agreed to participate. Parental permission was obtained; only two percent did not give their permission. Students freely chose to participate, and they were guaranteed complete confidentiality. Data were collected using a paper-and-pencil questionnaire, returned anonymously to the researchers. The final response rate was 94%. Additionally, answers were preliminarily examined to identify possible questionable response patterns like inconsistencies between positively and negatively worded items, and 33 responses were identified as questionable response patterns, which were not considered for the analysis [48]. Finally, the study sample consisted of 644 participants, 342 males (46.9%) and 302 females (53.1%), aged 12 to 17 years ( $M = 14.61$  years,  $SD = 0.50$  years). The sample sensitivity power analysis [45,49,50] showed that it could detect ( $N = 644$ ;  $\alpha = 0.05$ ;  $\beta = 0.10$ ) the expected effect sizes ( $|r| = 0.10$ ), and that the study power was slightly higher than expected ( $N = 644$ ;  $\alpha = 0.05$ ;  $|r| = 0.10$ ;  $1 - \beta = 0.82$ ).

### 2.2. Measures

#### 2.2.1. Drug Use

Drug consumption was measured with a short version of a scale in which adolescents report their involvement with alcohol, cigarettes, cannabis, and other illegal drugs. This procedure to capture drug consumption in adolescents has shown good reliability and validity [4,51,52], and it is frequently used in studies conducted in Europe [14,53] and the United States [53–55]. Adolescents were asked about their drug use and drunken episodes in the previous month on a four-point response scale (never, once a month or less, weekly, or daily), with higher scores indicating high drug use. The alpha value was 0.73. Based on the assumption of order within the sample (see Frick, 1996) [56], a median split (i.e., 50th percentile) was used to dichotomize participants according to their degree of drug use. Adolescents were grouped by the median split into substance users (56.3%) or non-substance users (43.7%) [57].

#### 2.2.2. Adolescents' Well-Being

*Self-esteem* was measured using the AF5 questionnaire [58], which follows the hierarchical and multidimensional theoretical structure proposed by Shavelson [21]. The AF5 scale has 30 items that evaluate five self-esteem dimensions: Academic, social, emotional, family, and physical. Each dimension is measured with six items on a 99-point scale, in which 1 is “strong disagreement” and 99 is “strong agreement”, so that greater rates represent a higher self-esteem in any of the dimensions. The AF5 questionnaire is a measure commonly used in adolescents [59–61] but also in adults [62,63]. Several empirical studies have tested the scale’s dimensional structure with exploratory [58] and also with confirmatory factor analyses [64,65] in different countries, including Spain [66], Portugal [67], Brazil [68], Chile [69], the United States [70] and, more recently, China [71]. Additionally, method effects associated with negatively worded items on the AF5 scale were not found [65,69]. Moreover, this instrument has been used to validate other self-esteem measures [72,73]. The alpha values for each subscale were 0.93, 0.85, 0.78, 0.86, and 0.84, respectively.

*Parenting acceptance/involvement* was measured with the ESPA29 Parental Socialization Scale [74]. The acceptance/involvement subscale consists of 116 items that ask adolescents about their parents’ parenting practices on a four-point rating scale, in which 1 is “never” and 4 is “always”, for 29 different

situations in Western culture: 13 of them specific to adolescents' compliance situations, and the other 16 to noncompliance situations. For each compliance situation, adolescents had to assess the parenting practices of affection and indifference. For each noncompliance situation, adolescents had to rate the parenting practices of dialogue and detachment. These ratings were averaged to yield a score on acceptance/involvement (also known as responsiveness). In particular, affection, dialogue, indifference, and detachment practices were included in the family acceptance/involvement score [74–76]. Greater scores represent a higher sense of acceptance/involvement. The ESPA-29 scale is commonly used in parenting studies conducted in different cultural contexts, such as Europe [77], South America [78] and, more recently, the United States [79]. Furthermore, the ESPA-29 questionnaire, originally developed in Spain, has also been validated in other languages, such as Portuguese [80] and English [81]. Additionally, the factor structure of the ESPA-29 is invariant across sex and age [82,83], and the two main dimensions (i.e., acceptance/involvement and strictness/imposition) are relatively orthogonal [71,76]. In the Spanish cultural context, greater parental acceptance/involvement is positively related to adolescent well-being [71,80,84]. The alpha values for the acceptance/involvement subscale was 0.97.

### 2.2.3. Adolescents' Ill-Being

*Parenting strictness/imposition* also was measured with the ESPA29 Parental Socialization Scale [74]. Strictness/imposition subscale consists of 96 items that ask adolescents about their parents' parenting practices on a four-point rating scale, in which 1 is "never" and 4 is "always", for 16 noncompliance situations in Western culture. For each noncompliance situation, adolescents had to rate the parenting practices of verbal scolding, physical punishment, and revoking privileges. These ratings were averaged to yield a score on strictness/imposition (also known as demandingness). In particular, verbal scolding, physical punishment, and revoking privilege practices were included in the family strictness/imposition score [74–76]. Greater scores represent a higher sense of strictness/imposition. In the Spanish cultural context, greater parental strictness/imposition is positively related to adolescent maladjustment [71,80,84]. The alpha values for the strictness/imposition subscale was 0.96.

*School misconduct and delinquency.* School misconduct was measured with five items that evaluate the frequency of behaviors like cheating, stealing, or damaging school property on a three-point response scale, in which 1 is "never" and 3 is "two or more times". Delinquency was also measured using a five-item scale assessing the frequency of delinquent or pre-delinquent behaviors, based on the same three-point rating scale [14,51,53–55]. Greater scores represent a higher sense of school misconduct and delinquency. The alpha values for each subscale were 0.63 and 0.74, respectively.

*Psychological maladjustment* was measured with the Personality Assessment Questionnaire—PAQ [85]. This questionnaire consists of 30 items designed to evaluate five indices of behavioral disposition: Hostility/aggression, negative self-adequacy, emotional unresponsiveness, emotional instability, and negative world view. The PAQ is one of the most prestigious measures for evaluating psychological maladjustment and is widely used across the world in more than 23 nations across five continents [86]. Each of these indicators is captured with six items on a four-point scale, ranging from 1 (almost never true) to 4 (almost always true). In the PAQ scales, greater scores represent a higher sense of psychological maladjustment [87]. The alpha values for each subscale were 0.65, 0.72, 0.68, 0.63 and 0.78, respectively. These reliabilities are similar to those obtained in other studies [86,88].

### 2.3. Statistical Analysis

Initially, the psychometric properties of the AF5 questionnaire were examined in order to ensure, first, an adequate measurement of self-esteem and, second, that the differences found between the groups could not be attributed to these properties (sex: men vs. women; age: 12 to 14 years old vs. 15 to 17 years old; substance use: substance users vs. non-substance users). Thus, a confirmatory factor analysis (CFA) was applied to test if the five oblique factor structure had a better fit to the data than the alternative models (i.e., one-dimensional and five-dimensional orthogonal). Previous

studies have shown that the distribution of some items tends to have a higher concentration of high scores. This response pattern leads to a pronounced negative skewness, and therefore to a deviation from multivariate normality [65,69,71]. Therefore, we used the robust option, the Satorra–Bentler chi-square statistic [89], and other alternative measures of model fit under conditions of non-normality: Comparative fit index (CFI) [90], where values  $> 0.95$  indicate a good fit, and values  $> 0.90$  indicate an acceptable fit [91,92] and the root mean square error of approximation (RMSEA) [93] and its 90% confidence interval (CI). RMSEA values  $< 0.05$  indicate good fit, values in the range of 0.05 to 0.08 indicate moderate fit, and values  $> 0.10$  indicate poor fit [94]. After that, a multigroup analysis of factorial invariance was conducted to test the equivalence/non-equivalence between the questionnaire structures across sex, age, and drug use. We applied four nested models that added progressive constraints by restricting free parameters. From the baseline model, the factor loadings across groups, the factor variances and covariances, and the equality of the error variances were fixed. These restrictions led to a progressive release of degrees of freedom and chi-square increases. If  $\Delta\chi^2$  ( $\Delta g$ ) is statistically significant, then the null hypothesis that the models are equivalent is rejected. However, based on the results of an extensive simulation study, Cheung and Rensvold (2002) [95] recommend using the change in CFI ( $\Delta CFI$ ) to test factorial invariance, where  $\Delta CFI < 0.01$  indicates that the factor structure is equivalent across groups.

To examine the relationships between the self-esteem dimensions and drug use, as well as their relations with the other indicators of psychosocial adjustment, we applied the Pearson correlation coefficient. These data were re-analyzed using partial correlations, controlling for sex and age as potential third variables that may influence these relations, in order to rule out spurious relations.

Furthermore, considering substance use, we applied a factorial multivariate analysis of variance (MANOVA) for each of the four sets of outcome variables (self-esteem, parenting, psychological maladjustment, and behavior problems). Univariate follow-up *F*-tests (ANOVA) were conducted on the sets of outcomes that showed significant differences in the multivariate analysis. Finally, we re-analyzed the ANOVAs, including sex and age as covariant variables (ANCOVA).

### 3. Results

#### 3.1. Factor Structure

Initial results indicated a deviation from a multivariate normal distribution according to different levels of skewness and kurtosis obtained for some items. The CFA results showed that the model of five oblique factors provided a better adjustment in comparison to the alternative models (see Table 1). It also confirmed that this model is equivalent for males and females, for the different adolescent age groups, and for drug users and non-users. So, from the baseline model ( $Tr_0$ ), the different groups showed the same factor loadings for each item ( $Tr_1$ ,  $\Delta CFI_{sex} < 0.01$ ;  $\Delta CFI_{age} < 0.01$ ;  $\Delta CFI_{drug\ use} < 0.01$ ), the importance of all five factors and its relational pattern was equivalent ( $Tr_2$ ,  $\Delta CFI_{sex} < 0.01$ ;  $\Delta CFI_{age} < 0.01$ ;  $\Delta CFI_{drug\ use} < 0.01$ ), and the error variances of items did not affect these groups differentially ( $Tr_3$ ,  $\Delta CFI_{sex} < 0.01$ ;  $\Delta CFI_{age} < 0.01$ ;  $\Delta CFI_{drug\ use} < 0.01$ ).



**Table 1.** Confirmatory factor analysis and multi-sample analysis for testing invariance across sex, age, and drug use.

Model	SB- $\chi^2$	gl	RMSEA [CI * 90%]	CFI	$\Delta$ CFI
Tr. Theoretical + $r_{\text{error}}$ #	1093.35	390	0.05 [0.05–0.06]	0.90	0.05
T. Theoretical: Five Fact. Obliq.	1416.51	395	0.06 [0.06–0.07]	0.85	0.04
O. Five factors orthogonal	1706.39	405	0.07 [0.07–0.07]	0.81	0.41
U. One-dimensional	4441.92	405	0.13 [0.12–0.13]	0.40	
<b>Sex (men vs. females)</b>					
Tr0. Theo.+ $r_{\text{error}}$ # multisamples	1591.22	780	0.04 [0.04–0.04]	0.88	
Tr1. Equal loading in the factors	1643.63	805	0.04 [0.04–0.04]	0.88	<0.01
Tr2. Equal var/cov. factors	1668.73	820	0.04 [0.04–0.04]	0.88	<0.01
Tr3. Equal variance of errors	1676.88	850	0.04 [0.04–0.04]	0.88	<0.01
<b>Age (12–14 years vs. 15–17 years)</b>					
Tr0. Theo.+ $r_{\text{error}}$ # multisamples	1502.68	780	0.04 [0.04–0.04]	0.89	
Tr1. Equal loading in the factors	1525.21	805	0.04 [0.04–0.04]	0.89	<0.01
Tr2. Equal va/cov. factors	1540.01	820	0.04 [0.04–0.04]	0.89	<0.01
Tr3. Equal variance of errors	1549.76	850	0.04 [0.04–0.04]	0.89	<0.01
<b>Drug use (users vs. non-users)</b>					
Tr0. Theo.+ $r_{\text{error}}$ # multisamples	1553.05	780	0.04 [0.04–0.04]	0.88	
Tr1. Equal loading in the factors	1578.79	805	0.04 [0.04–0.04]	0.88	<0.01
Tr2. Equal var/cov. factors	1597.30	820	0.04 [0.04–0.04]	0.88	<0.01
Tr3. Equal variance of errors	1683.54	850	0.04 [0.04–0.04]	0.88	<0.01

Note: SB- $\chi^2$  = Satorra-Bentler chi-squared; df = degrees of freedom; RMSEA = root mean squared error of approximation; CFI = comparative fit index; \* CI: the 90% confidence interval (CI) for RMSEA; # Model *Tr* is the same as *T*, except that in *Tr* has freed the restriction of independence for errors in pairs: 16–26, 12–22, 8–28, 4–14, and 10–25.

### 3.2. Self-Esteem and Drug Use

The Pearson correlation results showed that academic, family, and physical self-esteem dimensions were negatively associated with drug use, relations that persisted after applying the partial correlations. Social self-esteem was positively associated with substance use; but once the effect of sex and age was controlled for, this positive correlation was no longer statistically significant (see Table 2).

Results from the MANOVAs carried out considering substance use also showed statistically significant differences in self-esteem,  $\Lambda = 0.95$ ,  $F(5, 625) = 6.50$ ,  $p < 0.001$ . Univariate follow-up *F*-tests (Table 3) showed statistically significant differences in academic and family self-esteem, and non-substance users reported higher scores in academic and family dimensions of self-esteem than substance users. These results remained after applying the ANCOVA. The social dimension of self-esteem also showed statistically significant differences, with substance users indicated higher scores in social self-esteem than non-substance users. Nevertheless, this relationship was no longer shown to be significant after the demographic variables were statistically controlled (ANCOVA). The physical self-esteem dimension initially showed no significant differences. However, after applying the ANCOVA, this relationship was statistically significant, as non-substance users had greater scores in physical self-esteem than substance users.

**Table 2.** Correlation matrix for all the variables in the study (below the diagonal) and partial correlations, controlling for sex and age (above the diagonal).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Academic self-esteem	-	0.25 ***	-0.02	0.48 ***	0.31 ***	-0.33 ***	-0.35 ***	-0.23 ***	-0.12 *	-0.20 ***	-0.34 ***	-0.27 ***	-0.36 ***	-0.37 ***	0.30 ***	-0.07
2. Social self-esteem	0.20 ***	-	0.32 ***	0.29 ***	0.45 ***	-0.14 ***	-0.57 ***	-0.54 ***	-0.27 ***	-0.48 ***	-0.56 ***	0.07	0.01	<b>0.09</b>	0.23 ***	0.06
3. Emotional self-esteem	-0.05	0.30 ***	-	0.07	0.14 ***	-0.27 ***	-0.41 ***	-0.22 ***	-0.54 ***	-0.38 ***	-0.54 ***	<b>0.01</b>	0.06	0.09	<b>0.11 *</b>	-0.03
4. Family self-esteem	0.40 ***	0.28 ***	0.07	-	0.33 ***	-0.34 ***	-0.44 ***	-0.42 ***	-0.20 ***	-0.47 ***	-0.49 ***	-0.18 ***	-0.20 ***	-0.29 ***	0.64 ***	-0.16 **
5. Physical self-esteem	0.29 ***	0.41 ***	0.12 ***	0.32 ***	-	-0.13 **	-0.53 ***	-0.26 ***	-0.22 ***	-0.38 ***	-0.46 ***	-0.01	-0.03	-0.14 ***	0.21 ***	0.06
6. Hostility/aggression	-0.30 ***	-0.13 ***	-0.21 ***	-0.29 ***	-0.09 *	-	0.21 ***	0.31 ***	0.52 ***	0.29 ***	0.60 ***	0.40 ***	0.41 ***	0.35 ***	-0.21 ***	0.19 ***
7. Negative self-adequacy	-0.31 ***	-0.48 ***	-0.35 ***	-0.40 ***	-0.46 ***	0.18 ***	-	0.40 ***	0.44 ***	0.63 ***	0.78 ***	-0.01	0.07	0.05	-0.31 ***	0.01
8. Emotional unresponsiveness	-0.17 ***	-0.49 ***	-0.19 ***	-0.36 ***	-0.25 ***	0.29 ***	0.37 ***	-	0.27 ***	0.37 ***	0.59 ***	<b>0.15 **</b>	0.15 **	<b>0.10 *</b>	-0.38 ***	0.01
9. Emotional instability	-0.08 *	-0.22 ***	-0.47 ***	-0.16 ***	-0.19 ***	0.45 ***	0.35 ***	0.24 ***	-	0.43 ***	0.74 ***	<b>0.11 *</b>	0.03	0.17 **	-0.13 **	0.10 *
10. Negative worldview	-0.24 ***	-0.44 ***	-0.30 ***	-0.41 ***	-0.29 ***	0.31 ***	0.58 ***	0.36 ***	0.34 ***	-	0.75 ***	0.01	0.05	0.08	-0.36 ***	-0.02
11. Psychological maladjustment	-0.30 ***	-0.50 ***	-0.47 ***	-0.44 ***	-0.40 ***	0.59 ***	0.75 ***	0.59 ***	0.68 ***	0.72 ***	-	0.15 **	0.17 ***	0.20 ***	-0.36 ***	<b>0.08</b>
12. School misconduct	-0.27 ***	0.05	<b>0.08 *</b>	-0.13 **	0.06	0.39 ***	-0.02	<b>0.07</b>	<b>0.02</b>	0.07	0.11 **	-	0.62 ***	0.30 ***	-0.10 *	0.20 ***
13. Delinquency	-0.33 ***	0.03	0.07	-0.14 ***	0.04	0.41 ***	0.07	0.09 *	0.01	0.10 **	0.16 ***	0.65 ***	-	0.38 ***	-0.13 **	0.09
14. Drug use	-0.26 ***	<b>0.08 *</b>	0.06	-0.26 ***	-0.11 **	0.32 ***	0.05	<b>0.06</b>	0.10 *	0.09 *	0.18 ***	0.37 ***	0.43 ***	-	-0.15 **	0.09
15. Acceptance/involvement	0.29 ***	0.21 ***	<b>0.08</b>	0.55 ***	0.22 ***	-0.17 ***	-0.23 ***	-0.33 ***	-0.10 **	-0.27 ***	-0.29 ***	-0.12**	-0.15 ***	-0.17 ***	-	0.04
16. Strictness/imposition	-0.08	0.04	-0.04	-0.17 ***	0.08	0.19 ***	0.06	0.04	0.09 *	0.04	<b>0.12 **</b>	0.15 ***	<b>0.11 **</b>	0.05	0.06	-

Note: Correlations that varied their significance ( $\alpha = 0.05$ ) with the partial correlations are marked in bold. \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Table 3.** Means, adjusted means#, F, adjusted F#, statistical significance, adjusted statistical significance# in substance users vs. non-substance users.

Source of Variation	$M_{users}$	$M_{users}^{\#}$	$M_{non-users}$	$M_{non-users}^{\#}$	F	F <sup>#</sup>	p	p <sup>#</sup>
<b>Self-esteem</b>					(1, 631)	(1, 629)		
Academic self-esteem	68.93	68.93	73.78	73.78	7.81	7.70	0.005	0.006
Social self-esteem	<b>73.90</b>	<b>73.84</b>	<b>70.81</b>	<b>70.96</b>	<b>4.19</b>	<b>3.62</b>	<b>0.041</b>	<b>0.058</b>
Emotional self-esteem	57.48	57.49	57.21	57.18	0.24	0.33	0.877	0.856
Family self-esteem	78.76	78.68	84.88	85.08	14.74	16.00	<0.001	<0.001
Physical self-esteem	<b>55.90</b>	<b>55.71</b>	<b>59.37</b>	<b>59.87</b>	<b>3.48</b>	<b>5.04</b>	<b>0.063</b>	<b>0.025</b>
<b>Psychological maladjustment</b>					(1, 626)	(1, 624)		
Hostility/aggression	11.61	11.61	10.51	10.51	15.57	15.33	<0.001	<0.001
Negative self-adequacy	11.27	11.28	11.39	11.35	0.02	0.55	0.682	0.815
Emotional unresponsiveness	13.53	13.54	13.17	13.15	1.28	1.43	0.258	0.232
Emotional instability	16.01	16.01	15.26	15.26	6.77	6.89	0.009	0.009
Negative world view	10.70	10.71	11.16	11.15	2.14	2.01	0.144	0.157
<b>Behavior Problems</b>					(1, 631)	(1, 629)		
School misconduct	1.32	1.32	1.16	1.16	27.68	24.95	<0.001	<0.001
Delinquency	1.25	1.25	1.11	1.11	32.43	29.32	<0.001	<0.001
<b>Parenting</b>					(1, 642)	(1, 640)		
Acceptance/involvement	3.07	3.08	3.22	3.21	11.22	9.88	0.001	0.002
Strictness/imposition	1.67	1.67	1.67	1.67	0.02	<0.001	0.901	0.986

Note: Values that varied their significance ( $\alpha = 0.05$ ) with the ANCOVAs are marked in bold.



### 3.3. Self-Esteem and Other Well-Being and Ill-Being Indicators

Regarding the other well-being and ill-being indicators included in this study, the Pearson correlation results (see Table 2) showed that the well-being and ill-being indicators correlated positively with each other (e.g., psychological maladjustment and delinquency), and the well-being indicators correlated negatively with the ill-being indicators (e.g., acceptance/involvement and emotional unresponsiveness). The results for their relationships with the dimensions of self-esteem revealed that there were positive relations with well-being indicators (e.g., family self-esteem and acceptance/involvement), and negative relations with ill-being indicators (e.g., physical self-esteem and negative self-adequacy).

Additionally, the MANOVAs yielded statistically significant differences in psychological maladjustment,  $\Lambda = 0.94$ ,  $F(7, 620) = 5.55$ ,  $p < 0.001$ , behavior problems,  $\Lambda = 0.94$ ,  $F(2, 630) = 18.51$ ,  $p < 0.001$ , and parenting,  $\Lambda = 0.98$ ,  $F(2, 641) = 5.61$ ,  $p < 0.01$ . Univariate follow-up  $F$ -tests (Table 3) indicated that substance users obtained higher scores on ill-being indicators (e.g., emotional instability), and non-substance users obtained higher scores on well-being indicators (e.g., academic self-esteem). These relationships persisted after controlling for sex and age (ANCOVA).

## 4. Discussion

The scientific literature shows a lack of consensus about the relations between drug use and self-esteem. Despite this, self-esteem has been traditionally considered as an important correlate of psychosocial adjustment and, consequently, as a protective factor against drug use [14,22–24]; by contrast, some empirical studies have found that some self-esteem dimensions (e.g., social self-esteem) are risk factors [40–42,44].

Considering the current biopsychosocial perspective that defends the importance of psychological well-being for full health [1,6,7], the aim of this study was to analyze self-esteem (academic, social, emotional, family, and physical) and other adolescent well-being and ill-being indicators (psychological maladjustment, behavior problems, and parenting) as protective or risk factors for drug use in adolescents, in order to provide explanations for the inconsistencies in the research findings.

Thus, results of this study about the relations between self-esteem and drug use showed that: (1) Academic, family, and physical self-esteem were negatively associated with substance use and (2) at first, the social dimension of self-esteem was positively related to substance use. However, this positive relationship disappeared once the adolescents' ages and sexes were controlled for using both partial Pearson correlations and analysis of covariance (ANCOVA) [96,97].

These findings are consistent with previous studies that have negatively related drug use to some dimensions of self-esteem (academic, family, or physical dimensions) and positively to another one (social dimension) [41–44]. However, when findings show these important theoretical and practical inconsistencies (considering the academic, social, and physical self-esteem dimensions as protective factors and the social dimension of self-esteem as a risk factor for drug use), the possibility should be taken into account that these incongruences between the well-being and ill-being indicators may be produced by the lack of statistical control of third variables (demographic variables, i.e., sex and age), as demonstrated in this study. In this regard, it is important to highlight that the scientific literature provides considerable empirical evidence about sex and age differences in self-esteem dimensions [98–100]. Currently, most of the instruments that assess self-esteem are normalized by sex and age [14,58]. So, as an important contribution, these research findings involve the importance of statistically controlled demographic variables when the relations between self-esteem and drug use are analyzed, in order to avoid conclusions based on spurious relations.

With regard to the other well-being and ill-being indicators (psychological maladjustment, behavior problems, and parenting), the results show theoretically consistent relations before and after statistically controlling for the demographic variables. First, the well-being or ill-being indicators are positively related to each other and inversely related to the other indicators; second, the self-esteem dimensions are positively related to the well-being indicators and inversely related to the ill-being indicators.

Additionally, substance-users consistently showed the worst scores in the different well-being and ill-being indicators assessed, before and after applying the ANCOVA, which is consistent with previous empirical evidence about the importance of psychological well-being for full health [1,6–8,19,21].

Furthermore, the present study provides support for the AF5's multidimensionality of the concept of self-esteem [21]. The CFA results show that the AF5 five-dimensional correlated model provides better fit to the data than the one-dimensional and five-dimensional orthogonal models of self-esteem. These results are consistent with previous research using both exploratory [58] and confirmatory factor analyses [64,65,68–71]. On the other hand, results from multi-group factorial invariance analysis indicate that the factor structure of this instrument is invariant across the different groups being compared: sex (men vs. women), age (12 to 14 years old vs. 15 to 17 years old), and substance use (substance users vs. non-substance users). Each item in the factor to which it is theoretically assigned has the same relative importance across different groups. The five factors have an equivalent structure of variances and maintain an equivalent relational pattern of covariances. Finally, the results meet the assumption of equal error variances across groups for all the items on the questionnaire. Thus, when invariance between the groups exists, the source of differentiation within each group is the same in all case properties [64,99]. Therefore, the differences found between the groups cannot be attributed to the instrument's psychometric properties [65,68–70].

The present paper represents a relevant contribution to the literature, adding new empirical findings about how it is possible that, despite the fact that self-esteem has traditionally been considered as an important correlate of psychosocial adjustment, some empirical studies found that self-esteem may be unnecessary [35,37] or even detrimental to competence and adjustment, especially in drug use [40–44]. It should be noted that most of these results about some detrimental cost of self-esteem in terms of more drug use seem to be especially related to social self-esteem and a specific population (i.e., adolescents). Previous research has widely highlighted the peculiarities of adolescence in comparison to other periods of life [101]. In this sense, adolescence has been identified as a period related to some degree of psychosocial vulnerability [4,102]. Differences in adolescent competence and adjustment [103–106] can be related to different sources of influence [107–109], such as parents [110], school [111], or peers [112]. Nevertheless, the present study with Spanish adolescents revealed that, for the same data (that represent the same reality), the results about the relationship between self-esteem and drug use changes depending on the data analysis method (the questions decided by the researcher). In particular, without controlling for sex- and age-related differences, correlation analysis indicated that social self-esteem is positively related to drug use, as in some previous studies with adolescents [41–44]. By contrast, this significant relationship disappeared after statistically controlling for sex and age, using both partial correlation analyses and covariance analysis. Interestingly, the findings of this study reveal that, with the same data, a researcher can obtain different results depending on the data analyses. Therefore, the present findings highlight the need to control “third variables” (e.g., sex and age) in the data analysis in order to avoid some contradictory findings reported in the literature, such as the positive relationship between social self-esteem and drug use.

Drug use is a complex phenomenon that involves adolescents and their peers [113,114], adults as parents [5] and teachers [115], social factors such as mass media [116] and laws [117], or even the cultural context [113]. As Hawkins, Catalano, and Miller suggested (1992) [118], “the most promising route to effective strategies for the prevention of adolescent alcohol and other drug problems is through a risk-focused approach” (p. 64). However, it is not clearly in the literature whether all dimensions of self-esteem are always a protective factor against deviation, especially for drug use [40–42,44]. Although self-esteem has traditionally been considered a protective factor for adjustment [19,21], some studies with adolescents seriously question the idea that greater self-esteem in all dimensions is always positive for adjustment, and their empirical findings reveal that adolescents with greater social self-esteem tend to have higher drug use than those with poor self-esteem [41–44]. The present study reveals that greater self-esteem in all dimensions (i.e., academic, social, emotional, physical, and family) is always a protective factor against drug use. In particular, without controlling for the sex and age

variables, the results indicate that social self-esteem is a risk factor for drug use (i.e., greater self-esteem is related to more drug use), while controlling for the sex and age variables in the statistical analyses (i.e., partial correlation analyses and covariance analysis, ANCOVA), produces results that indicate that social self-esteem is a protective factor against drug use (i.e., greater self-esteem is related to less drug use). Therefore, the present findings are crucial for prevention science and adolescence because they provide new evidence about the real relations between self-esteem and drugs, offering possible explanations about some contradictory findings reported in some previous studies (e.g., adolescents with greater social self-esteem take more drugs) [41–44], and suggesting the need to take into account sex and age variables in the statistical analyses to avoid spurious conclusions.

The present study has several important strengths and some limitations. The strengths of this study are: (1) There was a concurrent assessment of a broad set of well-being and ill-being indicators of relevant psychosocial variables in adolescence. (2) A sample size calculation was performed in order to reduce the likelihood of a type II error in the statistical inference [49,97]. (3) Self-esteem was assessed in a multidimensional fashion, allowing us to evaluate the main aspects of self-esteem with only one measurement instrument. In addition, its invariance was specifically analyzed based on substance use, ensuring that the meaning of each dimension measured was the same for users and non-users. (4) The effect of third variables was tested using two different statistical techniques: Pearson correlations and analysis of variance. Some limitations should be considered. Although the sample size was adequate, it was limited to adolescents from 12 to 17 years old. Additionally, answers provided by adolescent self-reports and future studies should capture adolescent adjustment through other sources (e.g., reports from parents and teachers), although adolescents' self-reports are usually considered relatively valid and adolescents tend to give temporally consistent reports [119,120]. Additionally, all the participants were Spanish, so these results should be tested in other cultural contexts. Finally, the use of longitudinal data would have allowed us to analyze the causal relations between these variables, making it possible to argue that the onset of drug use is due to psychosocial maladjustment or vice versa.

Despite these limitations, this paper highlights the importance of psychological factors in health, extending current knowledge about the relationship between drug use and self-esteem. In short, the results provide support for the idea that self-esteem is an essential theoretical construct closely related to psychosocial adjustment in adolescence and, consequently, a significant factor in improving the treatment and prevention of substance use disorders.

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