

The relationship between internalizing and externalizing problems in adolescence: does gender make a difference?

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Externalizing problems arising during adolescence are usually associated with the experience of negative feelings. During this developmental stage, internalizing symptoms can also develop, and they occur with a higher prevalence in girls. Parents can be very important allies and useful alternatives in the identification of several aspects of internalizing/externalizing problems in childhood and adolescence. The main purpose of the current research was to obtain a deeper understanding of the relationships between externalizing and internalizing symptoms in adolescence, including analyses of the influence of gender on those relationships. The sample consisted of 1590 adolescents, between 12 and 16 years old, who completed the CDI to assess depressive symptoms, and their parents, who completed the CBCL, assessing externalizing and internalizing symptoms. Boys scored significantly higher on aggressiveness and hyperactivity, and girls reported higher values on the seven remaining dimensions of CBCL, internalizing index, and Total CDI. Effects sizes were small, however, and no differences were found for externalizing index. The internalizing index was positively, significantly, and moderately correlated with almost all the externalizing problems. The externalizing index, in turn, presented significant, positive and moderate correlations with depression, anxiety, obsessive-schizoid, withdrawal, and social problems. Externalizing problems successfully predicted internalizing problems (50,6% for girls versus 37,4% for boys). Opposition/Immaturity successfully predicted Internalizing Problems for both genders and aggressiveness was a significant predictor for girls only, though this relationship was weak ($\beta = .066$, $p = .031$). We also found a moderation effect for gender such that in higher levels of externalizing problems girls had more internalizing problems; this was not obtained for boys. The findings increase our knowledge of the interplay between externalizing, internalizing problems and gender, and can help optimizing interventions to prevent and treat the co-morbid internalizing and externalizing problems.

Key-Words: Externalizing problems, internalizing symptoms, depression, adolescence, gender

Introduction

Relationship between internalizing and externalizing problems

In early childhood, internalizing and externalizing problems are the most reliably diagnosed types of psychopathology. Data suggest that these problems are closely related and are likely to co-occur not only in childhood, but also in adolescence¹⁻⁵.

The conceptualization of externalizing and internalizing problems was initially proposed by Achenbach⁶. Internalizing symptoms are directed to oneself and thus may be more difficult to identify⁷. The internalizing symptomatology includes depression, anxiety and withdrawal⁸. On the other hand, externalizing behaviours are outer-directed⁷, and they comprise

behaviours like rule-breaking, aggression, impulsivity, and defiance⁸. Furthermore, children with internalizing problems are more likely to experience sadness, low impulsivity⁹, and exhibit less social contact¹⁰. In contrast to children with internalizing problems, children with externalizing problems tend to experience anger and be impulsive⁹, and they are also inclined to show health compromising behaviours such as smoking¹⁰. Moreover, these sets of problems are associated with differing psychopathologies; e.g., conduct disorders seem to be solely associated with externalizing problems, anxiety disorders with internalizing symptoms and dysthymia with both¹¹.

Several studies with non-clinical samples have shown a positive relationship between internalizing and externalizing problems. For example, in a study of 4th graders Cole and Carpenter¹² found correlations from .40 to .73 between conduct problems and depressive symptoms as measured by self-report, peer and teacher reports. Rose, Rose, and Feldman¹³ also found correlations from .58 to .74 between these two set of problems, rated at 2, 4 and 5 years old by children's parents. Other correlations between externalizing and internalizing symptoms of .49 at 4 years old, .57 at 10 years old and .36 at 14 years old were also found by Bornstein, Hahn, and Haynes¹⁴. Additionally, Ormel and collaborators¹⁵ found an even smaller correlation of .27. In a more specific level, in a sample of 7th graders, Doyle and McCarty¹⁶ found correlations of attention problems delinquent behavior, aggressive behavior and an externalizing index composed of the last two variables with several internalizing symptoms including withdrawn, somatic complaints, anxious/depressed, and social problems. Those correlations ranged from .13 (delinquent behavior with somatic complaints) to .66 (externalizing with internalizing problems). Regarding participants with high levels of internalizing and/or externalizing symptomatology, Eisenberg and collaborators⁹ also found positive but smaller associations between internalizing symptoms and externalizing behaviours as observed by parents.

Models of directional perspective

Regarding the development of internalizing and externalizing problems, there are some different perspectives with several studies supporting each perspective.

According to the Failure Model¹⁷, conduct problems may give rise to failures in social situations and, consequently, may lead to depression and anxiety. This hypothesis is in line with results suggesting that externalizing behaviours precede internalizing ones¹⁸⁻²⁶.

In contrast, the hypothesis of acting out states that depressive symptomatology results in acting out behaviours²⁷, and the hypothesis of anxiety underlying aggression, which claims that anxiety leads to aggressive behaviours²⁸. Many data partly support those hypotheses, as they suggest that internalizing problems precede externalizing ones²⁹⁻³³. More specifically, Bornstein and collaborators¹⁴ found that 4 year olds with more internalizing symptoms tend to have more internalizing symptoms at the age of 10 and more externalizing symptoms at the age of 14. Another investigation³⁴ suggests that co-morbid anxiety and depression and symptoms of depression co-morbid with withdrawal influence the development of externalizing problems. Also, according to the same authors, as age increases, internalizing symptoms seem to explain more of the externalizing problems.

Likewise, there are studies that suggest that the influence on the origin of those problems is mutual. In other words, changes in one cluster of problems are related to changes in the other and one kind of problem may act as a risk factor for the other³⁵⁻³⁸. A study by Wiggins, Mitchell, Hyde, and Monk³⁹ showed that externalizing and internalizing symptoms seem to

influence each other, at least throughout childhood. Apparently, internalizing symptoms may be a mechanism through which externalizing problems grow over time. More specifically, externalizing behaviour in toddlers seems to be linked to future internalizing symptoms at age 5. In turn, internalizing symptoms are associated with greater levels of externalizing symptoms at 9 years old. Moreover, externalizing behaviour at the age of 5 years is related to subsequent intensification of internalizing problems at age 9. According to the same authors, children's externalizing behaviour may result in rejection by their peers and academic failure, which may trigger feelings of anxiety and depression leading to intensify externalizing symptoms.

The role of third variables in explaining the relationship between internalizing and externalizing problems

Covariations of disorders have been studied and factors that are related to internalizing and externalizing problems are hypothesized to underlie both types of problems. Covariation between externalizing and internalizing problems may be partly explained by developmental environmental factors such as parenting stress, parental mental health, inadequate parenting and social problems, peer rejection, and involvement with anti-social peers^{38, 40-48}.

Thus, third variables may play a crucial role in directing the influence of externalizing and internalizing problems on one another. For example, Stone, Otten, Engels, Kuijpers, and Janssens⁴⁹ found that externalizing behaviours have a strong association with subsequent clinically severe internalizing symptoms, even when third variables are controlled for; however, the externalizing problems seem to serve as maintenance factors rather than precipitating factors. Furthermore, the same authors also found that internalizing problems seem to be related to subsequent onset, but not stability over time, of externalizing behaviours. Nonetheless, this association is decreased when taking into account third variables (i.e., inadequate parenting, parenting stress, mental health, and social preference). Additionally, in an investigation that followed preschoolers through adolescence, predictive paths from externalizing problems to internalizing symptoms were found, and these paths did not change when social problems were included as a third variable³⁸.

As transactional ecological models of psychopathology suggest, the interaction between psychological, biological and social systems influences the development of externalizing and internalizing problems^{50, 51}. Thus, the directionality of the problems is indeed a complex matter that involves a variety of variables. In fact, in Berkowitz's⁵² view, the accumulation of frustrations and losses may lead to the development of negative scripts and schemata that are accompanied by emotional pain associated with internalizing problems.

The effect of gender

Gender is a variable that has been associated with both internalizing or externalizing problems. Apparently, in childhood and adolescence, males tend to exhibit externalizing behaviours whereas females are more likely to have internalizing problems^{1, 15, 36, 53-56}. More specifically, girls tend to show more somatic complaints and symptoms of anxiety and depression, are less rule breaking and show less attention problems than males⁵⁷.

The developmental paths also seem to vary by gender. An investigation by Weeks and collaborators⁵⁸, concluded that although higher levels of internalizing symptoms at ages 8 and 9 appear to predict lower levels of externalizing behaviors at ages 12/13, this prediction was stronger for boys. On the other hand, the more the externalizing behaviours between 12 and 13 years old, the higher the levels of depression at ages 16/17. There was a stronger prediction for girls. Another study by Lee and Bukowski³⁷ showed that boys and girls in early adolescence

have dissimilar increase patterns of elevation in externalizing and internalizing problems. Hence, males present a bidirectional progression of each set of problems to the other, whereas girls seem to have a unidirectional progression from externalizing to internalizing problems.

Importantly, Perle and collaborators³⁴ suggested that gender is a significant moderator in the relationship between internalizing problems and externalizing behaviours at various periods of childhood development (1st, 5th, and 6th grades). Also in a study from Lacasa, Mitjavila, Ochoa, and Balluerka⁵⁹, depression, somatic complaints and internalizing symptoms were predicted by female gender but delinquent behaviour was predicted by male gender.

In summary, gender is a variable that seems to exert a significant effect on internalizing and externalizing problems, as well as in their relationship; an effect that is worth further consideration.

Objectives

This study is part of a wider project aiming at identifying risk factors for the prevention of depression (Prevention in Depression in Portuguese Adolescents: efficacy study of an intervention with adolescents and parents). Being a transversal study and having an internalized dependent variable, the main goal of this research was to explore the relation between externalizing and internalizing symptoms and the effect of gender in this association. Thus, we mainly expected: 1) positive and significant associations between externalizing and internalizing problems; 2) that externalizing behaviours would predict internalizing ones; 3) since we also expected gender differences in externalizing and internalizing symptoms, they were explored; 4) finally, it was also expected that gender would be a significant moderator in the relationship between the two set of problems mentioned above.

Methods

Participants

Participants were 1590 adolescents and 1580 Portuguese parents. The adolescent sample age ranged from 12 to 16 ($M = 13.89$; $SD = .94$) with more female adolescents (65%, $n = 1030$, $M = 13.85$, $SD = .85$) than male adolescents (35%, $n = 560$, $M = 13.89$, $SD = .94$). There were no significant age differences between genders [$F(1.1573) = .664$, $p = .415$]. The parents sample age ranged from 29 to 77 with a majority of females (86%, $n = 1374$) with mean age of 42.77 ($SD = 5.43$) and 13% of males ($n = 206$) with mean age of 45.71 ($SD = 5.41$). Regarding socioeconomic status, 48% of the families ($n = 755$) were in the *low* category, 24% ($n = 374$) were *medium* level, and 14% ($n = 220$) were from the *high* category. No significant gender differences were found within the socioeconomic status categories [$\chi^2(2) = .871$, $p = .647$].

Procedure

National entities regulating scientific research authorized this study. The participants were informed about the goals and procedures of the study, the voluntary nature of their participation, and the confidentiality of the data. Adolescents agreed to participate and parents signed an informed consent. The self-report measures were administered in a classroom setting in the presence of the researchers. The parents completed the self-report measures at home and returned them through their children to the researchers.

Measures

Children Depressive Inventory (CDI^{60,61})

The CDI is a 27-item, self-rated, and symptom-oriented scale that rates the severity of depression. It is designed for children/adolescents, ages 7 to 17 years old. Each of the 27 items comprises 3 sentences to rate the severity of the symptoms. CDI is composed of 5 subscales: Anhedonia, Ineffectiveness, Interpersonal Problems, Negative Mood, and Negative Self-Esteem and are summed to interpret a Total Score; the higher the score, the higher the severity of the depressive symptoms.

In the Portuguese validation studies the 5-factor structure was not found, but rather the CDI revealed a unifactorial structure^{61, 62}. Thus, in this study we utilized the CDI total score that had a Cronbach's alpha of .90 in the present sample.

Child Behaviour Checklist (CBCL⁶³⁻⁶⁵)

The CBCL is a parent-report questionnaire designed to diagnose a variety of behavioural and emotional problems of children aged 4-18. It is a 133 item instrument, assessed by a parent or care giver. The CBCL comprises 9 subscales (Opposition/Immaturity, Aggressiveness, Hyperactivity/Attention, Depression, Social Problems, Somatic Complaints, Withdrawn, Anxiety, and Obsessive/Schizoid) converging into 2 indexes (Externalizing and Internalizing Problems). In this study, Cronbach's alpha for Externalizing Index was .91 and for Internalizing Index .89. Cronbach's alpha for each factor is: Opposition/Immaturity .88, Aggressiveness .79, Hyperactivity/Attention .79, Depression .81, Social Problems .54, Somatic Complaints .75, Withdrawn .67, Anxiety .67 and Obsessive/Schizoid .63.

In the present study, the Externalizing Index was composed of the Aggressiveness and Opposition/Immaturity factors; whereas, the Internalizing Index was composed of Depression, Somatic Complaints, Withdrawn, and Anxiety factors.

Analytic Procedure

Data were computed using *Statistical Package for Social Sciences* (SPSS), version 22.0 for Windows.

To determine the normality of the data preliminary analysis were evaluated by using the *Kolmogorov-Smirnov test* and through analysis of the values of asymmetry (*skewness*) and flattening (*kurtosis*). Internal consistency of the scales was analyzed using *Cronbach's alpha* coefficient.

A one-Way ANOVA was computed to determine differences between genders. Besides using *p* significance to analyze gender differences, partial eta square values were also taken into consideration to analyze de effect size. Partial eta squared values between .01 and .06 were considered low, between .07 and .13 medium, and greater than .14 were large⁶⁶. In order to assess the relationship between the variables, Pearson correlation coefficients (*r*) were calculated, adopting the convention of Pestana and Gageiro⁶⁷: $r < .20$ very low correlation; $.20 < r < .39$ low correlation; $.40 < r < .69$ moderate correlation; $.70 < r < .89$ high correlation; and $> .90$ very high correlation.

Simple linear regressions were conducted in order to explore the prediction of Externalizing Index on the Internalizing one, separated by gender. Multiple linear regression models

were assessed to study the explained variance of the externalizing factors of CBCL on the Internalizing Index, using the total sample and separating by gender. To guarantee the adequacy of the data to the analysis, the assumptions for the linear regression models were tested and no problems were found regarding homoscedasticity, linearity, normality of residuals, autocorrelation and independence of errors (Durbin-Watson).

The moderator effect of gender in the relationship between Internalizing and Externalizing Problems was studied. According to Baron and Kenny⁶⁸ and Holmbeck⁶⁹, if the relationship between two variables can be influenced by a third variable in direction and/or strength, then the third variable is a moderator. To study this effect and in order to reduce the multicollinearity issues⁷⁰, both independent variables were standardized. Gender was dummy coded because it is a categorical variable with two levels (masculine and feminine). We then proceeded to use a hierarchical multiple linear regression, wherein adolescents' Internalizing Problems was established as a criterion variable. First, the predictor variable was entered, followed by the moderator. A variable corresponding to the multiplicative term between the independent variable and the moderator variable (gender) was created and entered next. Finally, a graphic was plotted for better understanding of the moderating findings.

Results

Preliminary analysis of the data

The Kolmogorov-Smirnov test suggested that the sample did not have a normal distribution. However, the measures of skewness and kurtosis did not display serious deviation to the normality of the distribution regarding skewness ($sk < |3|$) and kurtosis ($ku < |10|$) and were considered acceptable⁷¹. Also, according to Mordkoff⁷², the Central Limit Theorem states that the distribution of sample means reaches a normal distribution as the size increases, independently of the shape of the population sample. So as our sample size was big enough and there were no serious deviations to normality, we assumed the normal distribution of the sample.

Gender differences in depression evaluated by adolescents and internalizing and externalizing problems evaluated by parents

Descriptive statistics are presented regarding total sample and both masculine and feminine gender (means and standard deviations). The results of the One-Way ANOVA for Gender differences showed that girls obtained significantly higher scores on the CDI Total, Depression, Social Problems, Somatic Complaints, Withdrawn, Anxiety, Obsessive/Schizoid, Internalizing Index, and Opposition/Immaturity. In turn, boys scored significantly higher on Aggressiveness and Hyperactivity. Based on values derived from the partial eta square, all differences presented a small effect (Table 1).

Table 1. Means and Standard Deviation for the total sample and One-Way ANOVA for Gender Differences

	Total Sample		Adolescents				F	p	η_p^2
	M	SD	Female		Male				
			M	SD	M	SD			
CDI Total	11.25	7.37	12.29	7.7	9.34	6.29	60.61	.00	.037
CBCL Internalizing Problems									
Depression	2.42	2.81	2.61	2.95	2.07	2.51	13.22	.00	.008
Withdrawn	2.88	2.19	2.99	2.29	2.68	1.97	6.95	.01	.004
Anxiety	1.97	1.96	2.07	2.02	1.79	1.83	7.58	.01	.005
Obsessive/Schizoid	2.79	2.38	3.09	2.51	2.25	2.00	46.79	.00	.029
Somatic Complaints	1.33	1.75	1.56	1.91	0.90	1.30	52.70	.00	.032
Social Problems	2.24	1.91	2.37	1.95	2.01	1.81	12.70	.00	.008
Internalizing Index	8.59	7.08	9.22	7.54	7.44	5.98	23.15	.00	.014
CBCL Externalizing Problems									
Opposition/Immaturity	5.16	4.85	5.38	5.02	4.74	4.49	6.51	.01	.004
Aggressiveness	1.78	2.48	1.59	2.28	2.10	2.77	15.07	.00	.009
Hyperactivity	3.42	3.18	3.13	3.07	3.95	3.32	24.04	.00	.015
Externalizing Index	6.93	6.83	6.98	6.83	6.84	6.85	.17	.69	-

Relationship between depression evaluated by adolescents and internalizing and externalizing problems evaluated by parents

Pearson correlations were performed to assess the relationship between the variables. Regarding Internalizing Problems, depression evaluated by adolescents (CDI total) showed positive, significant ($p < .01$), relationships with CBCL Internalizing Index and Depression, Anxiety, Withdrawn, Obsessive/Schizoid, Somatic Complaints, and Social Problems (from .24, with Social Problems, to .38, with Internalizing Index). Concerning Externalizing Problems, depression evaluated by adolescents (CDI total) significantly ($p < .01$), related to CBCL Externalizing Index, Opposition / Immaturity, Hyperactivity and Aggressiveness (between .18 with aggressiveness and .27 with Opposition/Immaturity) (Table 2).

Table 2. Relationship between depression evaluated by adolescents, and Internalizing and Externalizing Problems evaluated by parents

CBCL	CDI Total
Internalizing Problems	
Depression	.36**
Withdrawn	.29**
Anxiety	.30**
Obsessive/Schizoid	.27**
Somatic Complaints	.28**
Social Problems	.24**
Internalizing Index	.38**
Externalizing Problems	
Opposition/ Immaturity	.27**
Aggressiveness	.18**
Hyperactivity	.25**
Externalizing Index	.26**

** Correlation is significant at the 0.01 level (2-tailed)

Relationship between internalizing and externalizing problems as evaluated by parents

The Internalizing index was positively significantly, and moderately correlated with almost all the externalizing problems - Externalizing Index (.67), Aggressiveness (.50) and Hyperactivity (.58), presenting a high association with Opposition/Immaturity (.70).

The Externalizing index, in turn, presented significant, positive and moderate, correlations with the Internalizing Problems - Withdrawn (.60), Anxiety (.59), Depression (.58), Obsessive/Schizoid (.53), and Social Problems (.47).

Table 3. Correlations between Internalizing and Externalizing Problems

Internalizing Problems	Externalizing Problems			
	Opposition/	Aggressiveness	Hyperactivity	Externalizing
Depression	.59**	.44**	.51**	.58**
Withdrawn	.63**	.41**	.52**	.60**
Anxiety	.60**	.44**	.52**	.59**
Obsessive/Schizoid	.55**	.39**	.50**	.53**
Somatic Complaints	.40**	.29**	.30**	.39**
Social Problems	.48**	.38**	.30**	.47**
Internalizing Index	.70**	.50**	.58**	.67**

** Correlation is significant at the 0.01 level (2-tailed)

The internalizing dimensions showed low to moderate associations with the Externalizing Problems. The internalizing dimension of Somatic Complaints was the one that presented the lowest correlations with externalizing dimensions (from .29 for Aggressiveness to .40 for Opposition/Immaturity). Additionally, the externalizing dimension of Opposition/Immaturity showed the highest associations with the internalizing dimensions (from .63 for Withdrawn to .40 for Somatic Complaints). In contrast, the Aggressiveness presented the lowest correlations with the internalizing dimensions (from .29 for Somatic Complaints to .44 for Anxiety and Depression) (Table 3).

Prediction of the internalizing index by the externalizing problems

We conducted two simple linear regressions separated by gender, in order to analyze if Externalizing Index predicted Internalizing Index for both females and males. Regarding females, Externalizing Index predicted 50,6% of the Internalizing one (Table 4); the Externalizing Index only predicted 37,4% of the Internalizing one (Table 5).

Table 4. Simple Linear Regression: prediction of Internalizing Problems by Externalizing Problems for Females

	Unstandardized Coefficient		Standardized Coefficient	T	p	R ²	Adjusted R ²
	β	SE	β				
Externalizing Index	.786	.024	.712	32.480	.000	.506	.506

Table 5. Simple Linear Regression: prediction of Internalizing Problems by Externalizing Problems for Males

	Unstandardized Coefficient		Standardized Coefficient	T	p	R ²	Adjusted R ²
	β	SE	β				
Externalizing Index	.534	.029	.611	18.243	.000	.374	.372

In order to assess which externalizing variables best predicted Internalizing Problems, a multiple linear regression was computed, having two predictors: Opposition/Immaturity and Aggressiveness. The model accounted for 48,5% of the variance of the Internalizing Index, and only Opposition/Immaturity successfully predicted the previous index (Table 6).

Table 6. Multiple Linear Regression: prediction of Internalizing Problems by Externalizing Problems

	Unstandardized Coefficient		Standardized Coefficient	T	p	R ²	Adjusted R ²
	β	SE	β				
Opposition/Immaturity	1.016	.037	.696	27.130	.000	.485	.484
Aggressiveness	.003	.073	.001	.039	.969		

Additionally, the previous analysis was conducted separately for each gender. For females, the regression model explained 52,2% of the variance of Internalizing Problems, with both predictors being significant (Table 7). For males, the model explained 39,9%, but only Opposition/Immaturity was a successful predictor (Table 8).

Table 7. Multiple Linear Regression: prediction of Internalizing Problems by Externalizing Problems for Females

	Unstandardized Coefficient		Standardized Coefficient	T	p	R ²	Adjusted R ²
	β	SE	β				
Opposition/Immaturity	1.014	.046	.674	22.077	.000	.522	.521
Aggressiveness	.218	.101	.066	2.155	.031		

Table 8. Multiple Linear Regression: prediction of Internalizing Problems by Externalizing Problems for Males

	Unstandardized Coefficient		Standardized Coefficient	T	p	R ²	Adjusted R ²
	β	SE	β				
Opposition/Immaturity	.836	.068	.627	12.202	.000	.399	.397
Aggressiveness	.013	.111	.006	.119	.905		

Moderator analysis

Multiple hierarchical regression analysis was used in order to examine the predictive power of the Externalizing Problems index on Internalizing Problems index when moderated by gender; this analysis showed there was a moderating effect of gender ($\beta = -.50, p < .001$). Both Externalizing Problems ($\beta = .67, p < .001$) and gender ($\beta = -.11, p < .001$) predicted depression symptoms. Both Externalizing Problems and gender variables presented significant models in steps 1 and 2, which accounted for 45% and 47% of the variance of Internalizing Problems. The 3rd step (interaction term of Externalizing Problems * gender) also presented a significant model that showed a slight increase in the percentage of the variance explained of the Internalizing Index (48% of the variance explained) (Table 9).

Table 9. Regression coefficients and model of the three steps of hierarchical multiple regression with Externalizing Problems evaluated by parents and Gender

	R	R ²	F	p	β	t	p
Model 1				.000			.000
Externalizing Problems	.67	.45	1319.50	.000	.67	36.33	.000
Model 2				.000			.000
Externalizing Problems				.000	.67	36.68	.000
Gender	.68	.47	694.13	.000	-.11	- 6.17	.000
Model 3				.000			.000
Externalizing Problems				.000	.76	33.70	.000
Gender				.000	-.11	- 6.28	.000
Externalizing Problems * Gender	.69	.48	488.37	.000	-.50	- 6.44	.000

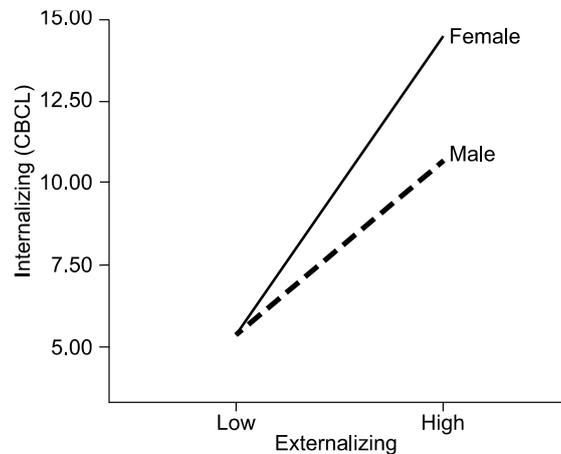


Figure 1. Gender’s moderator effect in the relationship between Externalizing Problems (CBCL) and Internalizing Problems (CBCL).

In the graph, two levels (below and above average) were created for the Externalizing Problems variable. Lower levels of Externalizing Problems were associated with lower levels of Internalizing Problems, but in higher levels of Externalizing Problems there were gender differences, specifically girls had more Internalizing Problems than boys (Figure 1).

Discussion

The main purpose of the present investigation was to explore the associations between externalizing and internalizing problems and the role of gender as a moderator of those relationship. More specifically, being part of a project to prevent depression through the identification and intervention of risk factors, this study aimed to explore the predicted power of externalizing symptoms on internalizing symptoms, moderated by gender. The conducted moderation was significant, suggesting that gender is indeed a moderator variable that is a risk factor to the effects of externalizing factors on internalizing ones. More specifically, when adolescents have high levels of externalizing problems, it seems that girls will have higher levels of internalizing symptoms than boys. When adolescents have low levels of externalizing symptoms, there seems to be no gender differences in the internalizing symptoms. Therefore, at high levels of externalizing problems, being a girl appears to be a risk factor for having high levels of internalizing symptoms.

Our analyses have shown that the comparison across genders seemed to point to the existence of gender differences, namely with girls scoring higher in all internalization variables and in some externalizing ones. However, effect sizes of gender differences were small. Hence the tendencies of girls to score higher than boys must be considered with extreme caution. The finding of no differences across genders in externalizing variables is consistent with previous data⁷³. Other studies have found that boys had more externalizing symptoms and girls internalizing problems^{1, 15, 36, 56}, namely, depressive symptomatology⁵³⁻⁵⁵. In the current study contrary to expectation, girls rather than boys seemed to score higher on the opposition/immaturity factor, although the effect size did not confirm the importance of this datum. This result may, in part, be explained by the fact that this factor included items that comprise crying and humor changes, which in girls may resemble mood problems. This resulted in non-significant differences across genders both on this factor and the externalizing index. Another hypothesis to explain these results may be the fact that we studied a non-clinical sample that reported fewer extreme scores than may be reported by a clinical sample; this might be responsible for the gender differences. Finally, the gender differences found by other studies may, in part, be due to the fact that most of these studies have only relied on the *p* value and have not taken effect size into account. The only study that considered effect size⁴⁶ also only found a small to medium effect size ($d = .38$) in one of the comparisons.

With respect to correlations, in general, depressive symptoms evaluated by the CDI, were highly and positively correlated with the internalizing and externalizing symptoms.

Notably, the associations of the depressive symptomatology with internalizing symptoms were higher than with externalizing ones. Those results match with the internalizing problems conceptualization that includes depressive symptoms as a part of the internalizing set of problems⁸. Our findings are also in line with previous findings that emphasized the existence of an interplay between internalizing and externalizing problems³⁵⁻³⁹.

It is interesting to note that, comparing internalizing factors, the somatic complaints had the weakest association with the externalizing index compared to other variables that are moderate. Hence, our results are in line with Doyle and McCarty¹⁶ whose weakest correlation was the one of somatic complaints with delinquent behavior (which corresponds to some items of our aggressiveness factor). This suggests that problems like nausea, aches, and dizziness do not usually co-exist with externalizing problems.

Opposition/immaturity was the externalizing factor that had the strongest associations with internalizing factors, presenting its highest correlation with the internalizing index. This result seems to be congruent with several other findings. Oppositional Defiant Disorder, characterized by oppositional symptoms, is considered to be strongly linked with internalizing symptoms⁷⁴ and also to be a risk factor for anxiety and depressive disorders⁷⁵. This might suggest that the association between oppositional symptoms and internalizing symptoms may be more relevant than the association between internalizing symptoms and other aspects of externalizing behaviours. Further, aggressiveness was the externalizing factor that presented the lowest correlations with all the internalizing dimensions, which lends weight to this hypothesis.

Regarding both sets of correlations, the correlations of the CDI with the several dimensions of the CBCL were lower than the ones between internalizing symptoms with externalizing symptoms assessed by the parents on the CBCL. This finding may indicate a discrepancy between informants (adolescents and parents), that other authors have also emphasized⁷⁶⁻⁷⁸. The lower correlations between adolescents and parents' reports may be due to the fact that

adolescents' self-reports are based in their own independent and subjective experience while their parents' reports are based on observations of their children's overt behaviour⁷⁸.

Simple regressions showed that the externalizing index was a significant predictor of internalizing problems, for boys and girls, which is congruent with other investigations¹⁸⁻²⁶. The predictive power of externalizing on internalizing symptoms was higher for girls than for boys.

Multiple linear regressions revealed that opposition/immaturity, but not aggressiveness, was a significant predictor of internalizing problems for adolescents. Analyzing the prediction of internalizing symptoms, separately, for boys and girls, we found that opposition/immaturity was a significant predictor for both genders, but aggressiveness only for girls. However, even though the p value reached significance, considering the very low beta coefficient of aggressiveness (.066) and the sample size of girls we consider the prediction to be of limited importance. Hence, we conclude that only opposition and not aggressiveness may be a risk factor for internalizing symptoms, both for males and for females. This result is in line with several ODD studies that found that symptoms of irritability predicted anxiety and depression in children²³; being touchy, angry, and vindictive seemed to predict depression in adolescent girls and boys²⁰. However, another study has found that physical aggression predicted depressive symptoms for both genders¹⁸. This discrepancy may be due to the studies' different instruments used to measure depression and aggression and that only physical aggression was assessed.

Comparing both genders in the predictive power of opposition/immaturity on internalizing we realize that opposition had a bigger predictive power for girls than for boys. This gender difference may also be related to the higher co-morbidity between ODD and internalizing symptoms in female adolescents^{74, 79}.

Our results suggest some clinical implications. Firstly, we should recognize the symptoms of one cluster in order to prevent or attenuate symptoms on the other cluster, with early intervention playing a crucial role. Thus, parents and teachers should be alerted and educated in order to recognize the early symptoms and seek professional services. Moreover, regarding treatment, co-variation, co-morbidity and the common risk factors are variables that should be taken into account.

General conclusions, limitations and future directions

Concerning our knowledge, this was the first study to address the role of gender as a moderator in the prediction of internalizing symptoms by externalizing behaviour. However, this investigation, like many others, has limitations. First, we did not include clinical samples in our study. We also did not include alternative sources of information other than adolescents and parents (e.g., teachers, peers). Thus, future research might focus on these relationships in clinical samples and/or take into account information coming from teachers and peers. It would also be interesting to evaluate moderating and mediating variables in future studies, and to perform longitudinal studies in order to describe the trajectories associated with childhood externalizing and internalizing symptoms, identifying pathways. This study also raises many questions that should be addressed: how the relations found between externalizing problems are associated with the onset and stability of internalizing problems (or vice-versa); if these relationships can be explained by third variables and if internalizing and externalizing problems are reciprocally or uni-directionally related.

In sum, our study confirms the hypothesis that externalizing symptoms are a risk factor for internalizing ones and that gender plays a role in this relationship. Thus, it is important not

to dismiss internalizing symptoms and their treatment in externalizing disorders, especially among female adolescents.

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