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**DOI**

[10.3390/laws3040706](https://doi.org/10.3390/laws3040706)

**Publication date**

2014

**Document Version**

Final published version

**Published in**

Laws

**License**

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**Citation for published version (APA):**

van Langen, M. A. M., Stams, G. J. J. M., Van Vugt, E. S., Wissink, I. B., & Asscher, J. J. (2014). Explaining female offending and prosocial behavior: the role of empathy and cognitive distortions. *Laws*, 3(4), 706-720. <https://doi.org/10.3390/laws3040706>

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Article

## Explaining Female Offending and Prosocial Behavior: The Role of Empathy and Cognitive Distortions

Marita A. M. van Langen \*, Geert Jan J. M. Stams †, Eveline S. Van Vugt †, Inge B. Wissink † and Jessica J. Asscher †

Department of Forensic Child and Youth Care Sciences, University of Amsterdam, P.O. Box 15780, Amsterdam 1001 NG, The Netherlands; E-Mails: g.j.j.m.stams@uva.nl (G.S.); e.s.vanvugt@uva.nl (E.V.); i.b.wissink@uva.nl (I.W.); j.j.asscher@uva.nl (J.A.)

† These authors contributed equally to this work.

\* Author to whom correspondence should be addressed; E-Mail: m.a.m.vanlangen@uva.nl; Tel.: +31-205-251-358.

External Editor: Tamar R. Birckhead

Received: 11 July 2014; in revised form: 25 September 2014 / Accepted: 30 September 2014 / Published: 15 October 2014

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**Abstract:** The aim of the present study was threefold: to examine (1) the relation between both cognitive and affective empathy and prosocial behavior; (2) the relation between both cognitive and affective empathy and offending; and (3) the role of cognitive distortions in the relation between cognitive empathy, affective empathy and offending in a sample of adolescent girls with lower SES and education ( $N = 264$ ). Results showed that both cognitive and affective empathy were positively related to prosocial behavior. Furthermore, cognitive empathy was positively related to offending, whereas affective empathy was not related to offending. Finally, no support was found for our hypothesis that cognitive distortions play a moderating role in the relation between empathy and offending.

**Keywords:** prosocial behavior; offending; empathy; cognitive distortions; female; adolescents

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## 1. Introduction

Research indicates that lower levels of empathy and higher levels of cognitive distortions are related with delinquent behavior [1–4]. Therefore, these factors are regularly used as targets in interventions developed for juvenile justice facilities, such as EQUIP [5,6]. However, most studies are based on male offender samples only. In order to make prevention of female delinquency effective, it is important to examine dynamic risk factors in female adolescents [7]. In addition, the focus of research, to date, has been primarily on the development of antisocial behavior and offending, while there has been little attention for the development of prosocial behavior [8]. Accordingly, the aim of the present study is threefold: to examine: (1) the relation between both cognitive and affective empathy and prosocial behavior; (2) the relation between both cognitive and affective empathy and offending; and (3) the role of cognitive distortions in the relation between cognitive, affective empathy and offending in a sample of adolescent girls with lower SES and education.

### 1.1. Empathy and Prosocial Behavior

Cohen and Strayer [9] conceptualize empathy as the ability to understand and share in another's emotional state and context. Empathy is a multidimensional construct comprising both cognitive and affective processes (e.g., [10,11]). Cognitive empathy can be described as the ability to understand the feelings and emotions of the observed person, while affective empathy is the capacity to share another's emotional state, and to experience the feelings of the observed person [1,9,12]. Research showed that females generally self-report higher levels of empathy than males [13,14]. Empathy is an individual characteristic that is considered to play an essential role in moral development and prosocial behavior [15–17].

Prosocial behavior has been defined as a series of voluntary and positive actions that result in benefits for other persons [18], such as sharing, cooperating, helping, supporting and comforting [19]. Although several factors may contribute to prosocial behavior, empathy is seen as one of the most important instigators of prosocial behavior [20]. When people have a better understanding of the other's position, and share in and empathize with the other's feelings, they are able to respond more appropriately in social interactions [21–23].

A considerable amount of research has shown a relation between empathy and prosocial behavior. For instance, Eisenberg and Miller [18] found a positive relation between self-reported empathy and prosocial behavior in their meta-analysis. More recently, Eisenberg, Eggum, and Di Giunta [24] found a positive relation between empathy-related responding and prosocial behavior in a comprehensive review. Carlo and Randall [25] showed both cognitive and affective empathy to be positively related to helping behavior in late adolescence. Stams *et al.* [26] revealed that higher levels of affective empathy were associated with more prosocial behavior in a sample of non-delinquent adolescents. Yoo, Feng, and Day [27] showed that higher levels of empathy and prosocial behavior at pre-test predicted higher levels of empathy and prosocial behavior four years later in a sample of male and female adolescents. Finally, Roberts and Strayer [28] found empathy to be a strong predictor of prosocial behavior in boys between 5 and 13 years old. However, in contrast, the relation between empathy and prosocial

behavior for girls was found to be modest in size. Possibly, these differences in the strength of the relation between empathy and prosocial behavior are the result of gender differences in empathy.

### 1.2. Empathy and Offending

Empathy is also considered an important factor in explaining antisocial behavior and offending. The relation between lower levels of empathy and antisocial behavior, such as vandalism and delinquency, is partly explained by inhibition of behavior that is harmful to others [12,29,30]. In a comprehensive meta-analysis, Jolliffe and Farrington found that lower levels of cognitive empathy were more strongly related to delinquency than affective empathy [1]. Similar results were found in a replication and extension of the study of Jolliffe and Farrington by Van Langen *et al.* [2].

Although many studies found an association between empathy and offending, there are also indications that this association is moderated by gender. For instance, Van Langen *et al.* [2] found that within the group of males, a moderate difference in empathy was found between offenders and non-offenders, whereas no difference in empathy was found between female offenders and non-offenders. In another study of empathy and self-reported offending in adolescents, females who reported offenses had equal scores on measures of empathy compared to those who did not commit offenses [31]. Besides possible gender differences, Jolliffe and Farrington [1] found that the relation between affective empathy, cognitive empathy and offending disappeared after controlling for intelligence and SES. Therefore, more studies on the relation between empathy and offending in adolescent females with lower education and SES are needed.

### 1.3. Cognitive Distortions, Empathy and Offending

Cognitive distortions have been designated as “inaccurate or biased ways of attending to or conferring meaning upon experiences” ([32], p. 1) that may serve to neutralize potential feelings of empathy and to justify antisocial or delinquent behavior [3,6,33]. Examples of such (self-exculpatory) cognitive distortions are blaming others, minimizing/mislabeling (*i.e.*, depicting antisocial behavior as causing no real harm), and assuming the worst (*i.e.*, attributing hostile intent to others, worst case scenario thinking, and considering behavior as beyond improvement). Self-serving cognitive distortions help to protect the individual from a negative self-concept and negative feelings, such as self-blame, and permit an individual to justify antisocial behavior or offending [4,34,35]. Ribeaud and Eisner [36] found that self-serving cognitive distortions, moral disengagement [37] and neutralization techniques [38] conceptually and empirically capture the same cognitive processes.

Lardén *et al.* [33] found a significant negative relation between self-serving cognitive distortions and an overall measure of empathy in a sample of incarcerated delinquents and community control adolescents. In addition, research of Barriga, Sullivan-Cosetti, and Gibbs [15] showed that both cognitive and affective empathy were negatively related to cognitive distortions. In other words, higher levels of cognitive distortions were related to lower levels of cognitive and affective empathy in juvenile delinquents. It is also suggested that lower levels of empathy alone may not result in offending behavior, but only in combination with cognitive distortions as these allow disregarding the other person’s feelings. Finally, Helmond, Overbeek, Brugman, and Gibbs [39] conducted a meta-analysis and found that cognitive distortions were moderately related to aggressive ( $d = 0.63$ ) and delinquent

( $d = 0.51$ ) behavior (see also [3,4,40,41]). Notably, Helmond *et al.* [39] also showed that interventions targeting cognitive distortions had a small but significant effect of  $d = 0.27$  on reducing cognitive distortions. However, in a subsample of studies that included measures of both cognitive distortions and externalizing problem behavior, effective treatment of cognitive distortions did not have a significant effect on the reduction of cognitive distortions and externalizing behavior. It is plausible to suggest that a single focus on cognitive distortions to reduce externalizing behavior is not sufficient given the multifaceted nature of externalizing behavior, and it is suggested to target cognitive distortions in close relationship to moral judgment [42] or empathy [2].

#### 1.4. The Present Study

Meta-analytic studies showed that there is only limited research on the relation between empathy and offending in samples of girls [1,2]. In addition, most research was carried out in samples of male offenders or college students (higher education and high SES). Moreover, few studies have been conducted on both cognitive and affective empathy, and as such the multidimensional structure of empathy is neglected in the available literature on this topic. Last, there is no research available on the moderating role of cognitive distortions in the relation between empathy and offending, while this may be important for intervention and prevention efforts. Nas, Brugman, and Koops [43] recommended focusing on cognitive distortions in non-delinquent adolescents as an important risk-factor for offending.

The present study focused on the relation between cognitive empathy, affective empathy, and both prosocial behavior and offending in a sample of female adolescents with lower SES and lower educational level, which have been identified as risk factors for later offending [44,45]. The first aim of the present study was to examine the relation between empathy and prosocial behavior. Based on prior research, we expect that both cognitive and affective empathy are related to prosocial behavior (e.g., [18,25,27]). There is no empirical evidence to suggest that cognitive distortions play a moderating role in the relation between empathy and prosocial behavior. The second aim was to investigate the relation between cognitive, affective empathy and offending. We assume that cognitive and affective empathy are not associated with offending behavior in a sample of females, after controlling for intelligence and SES [1,2,31]. The final aim of this study was to examine a moderating effect of self-serving cognitive distortions on the association between cognitive and affective empathy and offending. We expect that the level of cognitive distortions plays a significant moderating role in the relation between cognitive and affective empathy and offending. We expect that lower levels of empathy alone may not result in offending behavior, but only in combination with cognitive distortions. Alternatively, high levels of cognitive and affective empathy may not prevent offending when high levels of cognitive distortions are shown.

## 2. Method

### 2.1. Participants and Procedure

The sample consisted of 264 female adolescents ranging in age from 16 to 22 years old ( $M = 18.92$ ,  $SD = 1.49$ ). All participants were enrolled in intermediate vocational education at time of examination and part of the same school in the Netherlands (a total of 19 classes participated). SES was determined

by combining parents' educational level and professional status [46]. Mean scores were computed on the basis of sample-specific factor loadings and standard deviations. Scores between 3 and 9 indicate low socioeconomic status, scores from 9 to 12 middle socioeconomic status and scores from 12 to 16 higher socioeconomic status [47]. The mean SES score was  $M = 4.33$  ( $SD = 1.52$ ), indicating that the sample can be considered as lower class. According to their country of birth, participants with a foreign background were classified as western or non-western. If they were born in the Netherlands (second generation immigrants), the classification was based on the mother's country of birth [48]. According to this definition, 24.7% was of native Dutch origin, 42.9% of non-western origin, and 32.4% of western migrant origin.

After permission of the school board and after consent was obtained from each participant, the students completed the questionnaires individually during regular class hours in the classroom. All adolescents participated voluntarily in this study. They were told that they were free to decline to participate for any reason and at any time. Participants were assured that their answers would be treated completely confidentially and anonymously, and that the information provided would only be used for research purposes. Participants received no payment for completing the questionnaires.

## 2.2. Measures

*Delinquency.* For the measurement of delinquency over the previous year, a self-report delinquency scale was used [49]. The questionnaire consists of 36 items that measure different delinquent acts that participants may have committed, ranging from minor offenses (e.g., "damaged or destroyed property that did not belong to you") to serious acts (e.g., "used violence to rob someone"). Participants were asked to record the number of times they had been involved in any of the delinquent acts in the last year. Higher scores indicate more diverse and frequent offending. Cronbach's alpha was found to be 0.90 in this sample. Since the overall score was not normally distributed, for analysis purposes participants were divided into two groups based on their total score on the delinquency scale: 0 = committed no offence in the last year ( $n = 116$ , 43.9%); 1 = committed one or more offenses in the last year ( $n = 148$ , 56.1%).

*Basic Empathy Scale (BES).* The original version of the BES [12] is a 20-item self-report questionnaire designed to measure both cognitive and affective empathy in youth. In this study, we used a Dutch version of the BES. The cognitive scale of the BES consists of nine items and measures the ability to understand another person's emotions. An example of a cognitive item would be "It is hard for me to understand when my friends are sad". The affective scale consists of 11 items and measures the degree to which a person can share and experience another's emotions and feelings. An example of an affective item is "My friends' emotions don't affect me much". Participants rated the extent to which they agree with each statement using a 5-point Likert Scale, ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"). In this study, we found a Cronbach's alpha of 0.70 for the cognitive empathy scale and 0.69 for the affective empathy scale.

*How I Think (HIT) Questionnaire.* The HIT questionnaire is a 54 item self-report measure designed to measure self-serving cognitive distortions [32,34]. The questionnaire consists of 39 items measuring four types of cognitive distortions. The first, self-centered cognitive distortions refers to the belief that one's own views, needs, rights, immediate feelings and desires are so important that the opinions and

needs of others are not taken fully into account or are disregarded at all. The self-centered scale consists of nine items (“If I really want something, it doesn’t matter how I get it”). The second, blaming others, refers to misattributing blame for one’s harmful actions to outside sources, especially to another person, a group or to a momentary aberration, or misattributing blame for one’s victimization of other misfortune to innocent others. The blaming others scale consists of 10 items (“When I lose my temper, it’s because people try to make me mad”). The third, minimizing/mislabeling distortion, indicates that antisocial behavior is regarded as not harmful or as being acceptable or even admirable; or referring to others with belittling or dehumanizing labels. The minimizing/mislabeling scale consists of nine items (“Everybody lies, it’s no big deal”). Fourth, assuming the worst, concerns gratuitously attributing hostile intent to others, thinking that the worst-case scenario is inevitable in social situations, or assuming that improvement in one’s own or others’ behavior is impossible. The assuming the worst scale consists of 11 items (“You can’t trust people because they will always lie to you”). Of the remaining 15 items, eight are anomalous-responding items and seven positive filler items to camouflage the 39 main questions. Items were rated on a 6-point scale ranging from 1 (“Strongly disagree”) to 6 (“Strongly agree”). In this study, a Dutch translation of the HIT questionnaire was used [43]. Because of high correlations between the cognitive distortion scales (ranging between 0.63 and 0.75), and the related issues of multiple testing and multicollinearity, we conducted a principal component analysis, which yielded a one-dimensional solution: eigenvalue 3.05, explained variance 76%, factor loadings ranging from 0.85 to 0.90. The Cronbach’s alpha of the total scale for cognitive distortions was 0.90.

*Prosocial Behavior Questionnaire (PBQ).* The 20-item PBQ was used to measure prosocial behavior. The original version of the PBQ was designed by Weir and Duveen [19] as a teacher or parent report measure of children’s prosocial behavior. Rutten *et al.* [50] adapted this version to a self-report measure of prosocial behavior in adolescents. Participants rated the extent to which they agree with each statement using a 4-point Likert Scale, ranging from 1 (“Rarely applies”) to 4 (“Certainly applies”). An example of an item is “I spontaneously pick up things, which another person has dropped”. Cronbach’s alpha of the self-report version of the PBQ was found to be 0.88 in this sample.

*Groninger Intelligence Test, Subtest Verbal Reasoning (GIT).* The verbal reasoning subtest of the GIT [51] was administered to assess verbal IQ. The participants had to choose one word from five possibilities that correctly complete a  $3 \times 2$  matrix of logical semantic relations. Cronbach’s alpha was found to be 0.65 after removing six items with low or negative factor loadings.

*Social Desirability Scale.* The Social Desirability Scale [52,53] was used to measure the tendency to give socially desirable answers. The questionnaire contained 15 true/false items, (e.g., “I am always honest” and “I always practice what I preach”). The Cronbach’s alpha of the scale was 0.77.

### 3. Results

#### 3.1. Correlation Analysis

First, a correlation matrix was constructed to provide an overview of the associations between all variables (Table 1). As expected, cognitive and affective empathy were positively related ( $r = 0.38$ ,  $p < 0.001$ ). Furthermore, cognitive distortions were negatively related to both cognitive and affective

empathy ( $r = -0.17, p < 0.01$ ;  $r = -0.26, p < 0.001$ ). Besides, a significant positive relation between cognitive empathy and offending was found ( $r = 0.12, p < 0.05$ ), while affective empathy did not correlate with offending. Finally, both cognitive and affective empathy were positively related to prosocial behavior ( $r = 0.27, p < 0.001$ ;  $r = 0.28, p < 0.001$ ). Using Cohen's criteria [54], all correlations can be considered small.

**Table 1.** Interrelations between study variables.

Variable	1	2	3	4	5	6	7	8	<i>M</i>	<i>SD</i>
1 Cognitive empathy	-								4.17	0.54
2 Affective empathy	0.38 ***	-							3.82	0.54
3 Prosocial behavior	0.27 ***	0.28 ***	-						2.91	0.44
4 Offending	0.12 *	-0.02	0.04	-					-	-
5 Cognitive distortions	-0.17 **	-0.26 ***	-0.20 ***	0.04	-				2.19	0.61
6 Social desirability	0.01	0.04	-0.22 ***	0.22 ***	0.17 **	-			1.47	0.22
7 SES	-0.02	-0.07	-0.11	0.15 *	0.03	0.18 **	-		4.33	1.52
8 Verbal intelligence	0.23 ***	0.18 **	0.09	0.19 **	0.20 **	0.16 *	0.10	-	7.97	2.21
9 Age	-0.14 *	-0.07	-0.07	-0.10	-0.01	-0.09	-0.11	-0.04	18.92	1.49

Notes: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

### 3.2. Multiple Regression Analyses of Prosocial Behavior

Sequential multiple regression analyses were used to examine if cognitive and affective empathy were significantly associated with participants' ratings of prosocial behavior. Tests for multicollinearity indicated that a very low level of multicollinearity was present; variance inflation factors (VIF) ranged between 1.04 (age) and 1.82 (ethnicity). The  $R^2$  value of 0.09 indicates that 9% of the variability in prosocial behavior was explained by ethnicity, social desirability, verbal intelligence, SES and age ( $F(6219) = 3.72, p < 0.001$ ; model 1). Inclusion of cognitive and affective empathy did explain significantly more variance in prosocial behavior ( $\Delta R^2 = 0.09, \Delta F(2217) = 11.56, p < 0.001$ ), resulting in model 2 with  $R^2 = 0.18, F(8217) = 5.95, p < 0.001$ . In model 2, 18% of the variability in prosocial behavior was explained by the predictors. Table 2 shows the contribution of the individual predictors to the model. In model 2, social desirability, cognitive and affective empathy were significant predictors of prosocial behavior. Higher levels of cognitive and affective empathy and lower levels of social desirability were related to more prosocial behavior.

**Table 2.** Regression analyses with demographics and empathy as predictors and prosocial behavior as dependent variable.

Variables	Model 1		Model 2	
	$\beta$	$T$	$B$	$T$
Western ethnic minorities	-0.03	-0.40	-0.01	-0.12
Non-western ethnic minorities	0.11	1.20	0.11	1.31
Social desirability	-0.20 **	-2.85	-0.20 **	-3.01
Verbal intelligence	0.13	1.97	0.06	0.88
SES	-0.06	-0.89	-0.03	-0.51
Age	-0.10	-1.55	-0.06	-1.00
Cognitive empathy			0.19 **	2.73
Affective empathy			0.19 **	2.75
Constant	3.81 ***	7.78	2.45 ***	4.47
	$R = 0.30$		$R = 0.42$	
	$R^2 = 0.09$		$R^2 = 0.18$	
	$F(6219) = 3.72 **$		$F(8217) = 5.95 ***$	
			$\Delta R^2 = 0.09$	
			$\Delta F(2217) = 11.56 ***$	

Notes: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

### 3.3. Logistic Regression Analysis of Offending

Sequential logistic regression analyses were used to examine the relation between both cognitive and affective empathy and offending, and the moderating role of cognitive distortions in the relation between cognitive empathy, affective empathy and offending. First, we predicted offending from ethnicity, social desirability and verbal intelligence (model 1), second from cognitive and affective empathy (model 2), and third from cognitive distortions (model 3). The final model consisted of the variables included in model 3 and interactions between cognitive distortions and cognitive and affective empathy, respectively. Although the model fit did not increase by adding variables to the model, all models were significant (see Table 3). Interactions between cognitive and affective empathy and cognitive distortions were computed after standardizing the continuous variables [55]. The inclusion of the interactions between empathy and cognitive distortions in model 4 resulted in a significant model ( $\chi^2(11) = 23.65, p < 0.05$ ). Verbal intelligence ( $B = 0.15, p < 0.05$ ) was significantly and positively related to offending in model 4. The relation between cognitive empathy and offending was only marginally significant ( $B = 0.56, p = 0.06$ ), and could therefore be considered a trend. See Table 3 also for the contribution of the individual predictors to the model.

**Table 3.** Logistic regression analyses with empathy and cognitive distortions as predictors and offending as dependent variable.

Variables	Model 1			Model 2			Model 3			Model 4		
	B	Wald $\chi^2$ test	Odds ratio	B	Wald $\chi^2$ test	Odds ratio	B	Wald $\chi^2$ test	Odds ratio	B	Wald $\chi^2$ test	Odds ratio
Western ethnic minorities	-0.20	0.26	0.82	-0.18	0.21	0.83	-0.21	0.27	0.81	-0.20	0.25	0.82
Non-western ethnic minorities	-0.50	1.67	0.60	-0.47	1.43	0.63	-0.46	1.36	0.63	-0.46	1.33	0.63
Social desirability	1.03	2.05	2.80	1.03	2.02	2.80	0.95	1.68	2.59	0.96	1.70	2.61
Verbal intelligence	0.16 *	5.24	1.17	0.14 *	3.92	1.15	0.15 *	4.24	1.16	0.15 *	4.26	1.16
SES	0.14	1.95	1.15	0.15	2.17	1.16	0.15	2.21	1.60	0.15	2.17	1.16
Age	-0.06	0.43	0.94	-0.04	0.17	0.96	-0.04	0.15	0.96	-0.04	0.14	0.96
Cognitive empathy				0.56 *	3.45	1.74	0.57	3.59	1.77	0.56	3.41	1.75
Affective empathy				-0.21	0.55	0.80	-0.18	0.37	0.84	-0.18	0.38	0.83
Cognitive distortions							0.16	0.37	1.17	0.15	0.27	1.16
CE $\times$ CD										0.03	0.05	1.03
AE $\times$ CD										-0.03	0.02	0.97
Constant	-0.82	0.11	0.44	-2.68	0.84	0.07	-3.24	1.11	0.04	-3.19	1.07	0.04
	$\chi^2(6) = 19.67 **$			$\chi^2(8) = 23.23 **$			$\chi^2(9) = 23.60 **$			$\chi^2(11) = 23.65 *$		
	Cox & Snell $R^2 = 0.09$			$\Delta\chi^2(2) = 3.56, p = \text{n.s.}$			$\Delta\chi^2(1) = 0.37, p = \text{n.s.}$			$\Delta\chi^2(2) = 0.05, p = \text{n.s.}$		
	Nagelkerke $R^2 = 0.11$			Cox & Snell $R^2 = 0.10$			Cox & Snell $R^2 = 0.10$			Cox & Snell $R^2 = 0.10$		
	Nagelkerke $R^2 = 0.13$			Nagelkerke $R^2 = 0.14$			Nagelkerke $R^2 = 0.14$			Nagelkerke $R^2 = 0.14$		

Notes: CE = Cognitive Empathy, AE = Affective Empathy, CD = Cognitive Distortions; n.s. = non significant;

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

#### 4. Conclusions and Discussion

The first aim of the current study was to examine the relation between cognitive and affective empathy and prosocial behavior in a sample of female adolescents of lower SES and education. We found cognitive and affective empathy to be significantly related to prosocial behavior. This finding implies that female adolescents who report more cognitive and affective empathy also exhibit more prosocial behavior, which is consistent with results of previous research [25–28].

The second aim was to assess whether cognitive and affective empathy were related to female offending. Affective empathy was not significantly related to offending in female adolescents. This finding is consistent with our hypothesis and in line with previous studies. For instance, in a recent meta-analytical study, Van Langen *et al.* [2] found no relation between empathy and offending in female or mixed samples. As suggested by Jolliffe and Farrington [1], the absence of the relation between affective empathy and offending might result from the fact that the present study controlled

for intelligence and SES. That is, in their meta-analysis, Jolliffe and Farrington found that empathy differences between offenders and non-offenders dissolved after controlling for intelligence and SES.

Contrary to expectations, a significant positive relation (trend) between cognitive empathy and offending was found, which indicates that female adolescents who reported higher levels of cognitive empathy were more likely to offend. Although the positive relation between cognitive empathy and offending does not concur with meta-analytic results, some studies did find that cognitive empathy and offending were either not related (e.g., [56]) or positively related (e.g., [57]). However, it should be noted that these studies were based on adult male samples only. To our knowledge, there are no studies showing a positive relation between cognitive empathy and offending in females. Although higher levels of empathy are often related to positive behavior, such as prosocial and helping behavior, it might be that cognitive empathy (being able to understand other person's emotions) is used to manipulate others' behavior to suit one's own interests [58]. The final aim of this study was to examine the possible moderating role of cognitive distortions in the relation between empathy and offending. No support was found for the hypothesis that lower levels of empathy alone would not result in offending behavior, but only in combination with cognitive distortions. Possibly instruments may not have been adequate to assess cognitive distortions and offending in female adolescents (see limitations of this study). Another explanation would be that cognitive distortions and delinquency are only related in adolescents with higher intelligence, which was shown in a study by Nas [43].

Several limitations of the study need to be considered. The first limitation is the use of cross-sectional data. This implies that no strong inferences can be drawn with respect to causality. Experimental longitudinal research is required to assess whether empathy predicts offending behavior [59]. A second limitation is the generalizability of the findings. Participants were not randomly selected and originate from only one school of intermediate vocational education. In order to increase the generalizability, the study should be replicated in a greater number of schools with a larger variety of educational levels. The third limitation concerns the measurement of offending and cognitive distortions. The instrument used to measure offending consist of items that measure minor offenses and more serious acts. Most participants were identified as being an offender based on a single minor offense or several minor offenses (petty crime), whereas in most studies examining male delinquency, offending is based on several serious acts. Consequently, most female offenders in our study may be very similar to female non-offenders. Adolescent females, compared to their male counterparts, generally commit less serious crimes. Notably, Jolliffe and Farrington [31] found that less serious offending was not associated with low empathy. Last, it is still questionable to what extent the instrument used in this research is appropriate to assess cognitive distortions in females given that the HIT has only been validated in a sample of adolescent males [43]. More research on the psychometric properties of instruments in samples of females is necessary.

Despite these limitations, this study has several strengths. This is the first study on empathy and both prosocial behavior and offending in females. Furthermore, the moderating role of cognitive distortions in the relation between empathy and offending was not examined before. The findings of this study have implications for prevention efforts. Cognitive and affective empathy may be considered important factors in the development of prosocial behavior in girls with lower education and lower SES. If interventions aim to target prosocial behavior in these adolescent females, treatment should focus on the enhancement of cognitive and affective empathy. However, it appears that cognitive

empathy, affective empathy and cognitive distortions should not be a primary target in the prevention of female offending. Further research is needed in order to make prevention programs more effective according to the specific needs of females. It might be that moral cognition, such as moral judgment, is a more important predictor of delinquent behavior than moral emotions (e.g., affective empathy) [42,60]. Nevertheless, continued research on empathy and offending is important as the ability to understand and feel with others' emotions is necessary for moral judgment [61].

### Author Contributions

All authors contributed to the design of the study and to the writing of the manuscript. All authors read and approved the final manuscript.

### Conflicts of Interest

The authors declare no conflict of interest.

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