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THESIS

**Bridging the gap between moral judgment and antisocial behavior?**

*Moral identity and self-centeredness as potential mediating variables in the relationship between moral judgment and antisocial behavior in adolescents*

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## **Abstract**

The relationships between morality-related characteristics (moral judgment, moral value evaluation, moral identity and self-centeredness) and antisocial behavior are investigated using both production and recognition measures, because of an expected complimentary contribution. A sample of 295 adolescents (144 female; *Age* = 15.66 years) participated in the research. First, the production tasks were administered; one week later the recognition tasks. Multitrait-multimethod analysis showed an overall acceptable convergent validity of the measures. Path analyses confirmed the mediating role of self-centeredness and moral value evaluation in the relationship between moral judgment and antisocial behavior - however not for moral identity - and demonstrated that a latent variables model, using both production and recognition measures, improved the strength of the relationships considerably. Multiple regression analyses showed that the causal relationships were in general in accordance with the proposed model. The implications of the findings for future research and clinical practice are discussed.

## **Introduction**

Early in his career Kohlberg (1964, p. 425) defined moral judgment competence as “the capacity to make decisions and judgments which are moral (i.e., based on internal principles) and to act in accordance with such judgments.” According to this definition moral competence includes a behavioral component. Later on it was acknowledged that to act in accordance with one’s moral judgment was a process to be distinguished from the reasoning process in the formation of a moral judgment itself (Kohlberg, 1984). Moral judgment constitutes reasons or justifications for decisions or values that pertain to just or benevolent social action (Gibbs, 2010). Kohlberg’s stage theory of moral judgment, consisting of three levels representing two stages each, describes a development from externally motivated decisions in the preconventional level (authority, self-centered interests) to more internally motivated decisions in the conventional (relationships, societal authority) and postconventional level (democratic laws, internal principles). Later on the sixth stage was omitted, so that the universal invariant sequence was empirically supported. Gibbs’ revision (2010) of Kohlberg’s theory includes simply the first four stages: the first two stages representing the immature level, while the third and fourth stages form the mature level. The original post-conventional level is viewed as a more existential rather than the standard type of stage 3 and 4 reasoning.

In his classical review Blasi examined the hypothesis that moral reasoning and moral action are related. His ‘strongest’ support was the lower stage of moral judgment found in delinquents in comparison to nondelinquents (1980, p.570). This moral judgment delay in delinquents was more recently confirmed in a meta-analysis of 50 studies on moral judgment and delinquency with an overall effect size of  $d = .76$ ,  $p < .001$  (Stams, Brugman, Deković, van Rosmalen, van der Laan & Gibbs, 2006). Nevertheless, still many researchers (e.g. Barriga, Morrison, Liao & Gibbs, 2001) merely report small or even no relationship between moral reasoning and antisocial behavior in normal (non-incarcerated) adolescents.

In this same review Blasi (1980) criticized the operationalization of moral judgment involved in this relationship, noticing that some studies - using questionnaires (i.e. recognition measures) - were unable to distinguish the moral judgment level of delinquents from nondelinquents (cf. Gavaghan, Arnold & Gibbs, 1983). Stams et al.

(2006, p. 702) established that production measures (i.e. written or oral interviews) yielded larger effect sizes than recognition measures, according to which 'it is necessary that judgments be produced spontaneously in actual situations in order to guide action' (p. 702). Hence, the type of measurement method should be recognized as important in uncovering the relationship between moral judgment and antisocial behavior. However both measurements have their constraints. Whereas production measures are complex to score and time-consuming, recognition measures cannot provide as much information. Consequently, these methods are expected to be at least in part complimentary.

Since Blasi (1980; 1983) identified a gap between moral judgment and antisocial behavior, he initiated a movement away from moral judgment as the single moral variable explaining (im)moral behavior. Various intermediating variables were introduced to bridge the gap. Barriga and colleagues (2001) introduced a moral cognitive-process model studying moral identity and self-serving cognitive distortions as intermediating variables in the relationship between moral judgment and antisocial behavior in college students. Moral reasoning, moral identity and self-serving cognitive distortions are considered as moral cognitive variables, to be viewed as schemas that influence mainly the individual's attention or encoding, interpretation, attribution and evaluation in social situations (Barriga et al., 2001). Collectively, these variables accounted for 24 % of the explained variance in externalizing behavior, a considerable increase in comparison to the zero order relationship between moral judgment and externalizing behavior explaining only 10% of the variance. Self-serving cognitive distortions appeared to be the strongest predictor. Barriga et al. (2001) further concluded that the types of relationships between moral cognition and antisocial behavior are best described in terms of linearity. In terms of interaction between the different moral cognitive variables, they found no significant results and concluded that more extensive research is needed in order to explore the possible mediation or moderation between the moral cognitive variables.

In order to extend the findings of Barriga et al. (2001) the present study will use both production and recognition measures to study the relationships between moral reasoning and antisocial behavior, including the intermediating variables introduced below.

### **Moral identity**

According to Blasi (1983) a moral judgment can be made with different degrees of ego involvement and this aspect could influence the individual to the extent that it determines whether and which action will be performed. As a result Blasi (1983) proposed the Self model of moral functioning as a mediating factor: a moral judgment leads to action, when a) the moral values an individual pursues are important to the sense of self, b) he or she feels responsible for their moral judgment, and c) as a consequence, acts accordingly in order to be consistent with the sense of self. Arnold (1993) demonstrated that moral identity, defined as 'the degree to which adolescents identified closely with moral as opposed to nonmoral virtues' (p. 112), is a valuable independent predictor of prosocial behavior in adolescents, while the contribution of moral judgment appeared to be non-significant. Whereas Arnold (1993) established a positive relationship of moral identity to prosocial behavior, Barriga et al. (2001) found a negative relationship with externalising behavior in college students. Again moral judgment proved to be a nonsignificant predictor. Moreover in contrast to Blasi's theory (1983) no mediating relationship was found for moral identity in the relationship between moral judgment and externalizing behavior. Whereas Arnold (1993) used a structured interview to assess moral identity, Barriga et al. (2001) developed a questionnaire. Recently, Johnston and Krettenauer (2011), using the questionnaire methodology in a sample of normal adolescents replicated both positive and negative relationships between moral identity and pro- and antisocial behavior. However, the negative relationship between moral identity and antisocial behavior was found to be mediated by another moral affective variable: moral emotion expectancies. No studies are available in which both these measurement methods (production and recognition) for moral identity are used. The causal nature of the relations between moral identity and pro- and antisocial behavior remains unclear. With respect to prosocial behavior indications are found for a bidirectional or at least during adolescence an opposite relationship in which involvement in prosocial behavior can lead to an increased importance of moral values to the self and a stronger developed moral identity (Hardy & Carlo, 2005). Thus far no studies have been carried out on the causal relationship with antisocial behavior.

### **Self-centered as a primary self-serving cognitive distortion**

Besides the direct effect on antisocial behavior, Barriga et al. (2001) found that moral identity was also partially mediated by another predictor called “self-serving cognitive distortions”. In an attempt to integrate the various theoretical views concerning these thinking errors Barriga et al. (2001) distinguished primary and secondary self-serving cognitive distortions. Primary cognitive distortions are supposed to be the driving force of antisocial behavior. This assumption is based on social-cognitive theories explaining antisocial behavior as a consequence of deficiencies in interpreting social events that people act upon. Secondary cognitive distortions on the other hand have been characterized as pre- or post transgression neutralizers functioning to protect self-esteem (Sykes & Matza, 1957). The primary self-serving cognitive distortion is labeled ‘self-centered’, meaning that one’s own thoughts, attitudes and beliefs are valued over the legitimate views and needs of others or sometimes even over one’s own long-term interests. The self-centered distortions are described as stemming from an egocentric bias (Gibbs, Potter & Goldstein, 1995). In normal developing children, this bias declines when working memory and perspective taking skills develop. In contrast, juvenile delinquents are more persistent when it comes to this egocentric bias. The confusion of their own salient needs, desires and impulses with the perceived fairness of a situation is most likely the cause of the self-centered way of thinking (Gibbs, 2010).

Self-serving cognitive distortions have demonstrated a positive association to antisocial behavior in both delinquent and nondelinquent adolescents and accounted for a substantial part of the explained variance (Barriga, Gibbs et al., 2001; Nas Brugman & Koops, 2008; van der Velden, Brugman, Boom & Koops, 2010). A negative relationship with moral judgment was found by Barriga et al. (2001), and van der Velden and colleagues (2010) showed that higher levels of self-serving cognitive distortions lead to a lower stage of moral reasoning in girls. In the single study investigating the causal nature, antisocial behavior preceded self-serving cognitive distortions, which could explain the function of secondary self-serving cognitive distortions as post transgression neutralizers (van der Velden et al., 2010). With regard to the postulated driving function of self-centeredness no empirical evidence is available.

### **Moral value evaluation**

Whereas Barriga et al. (2001) solely studied moral cognitive variables, Beerthuizen en Brugman (2011) added a moral affective variable named moral value evaluation to the moral process model that only recently has been attracting attention in empirical research. Beerthuizen en Brugman (2011) defined moral value evaluation as the attribution of importance to moral values, representing the five moral value domains (i.e. contract and truth, affiliation, life, property and law and legal justice) of the twelve moral values central to everyday life originally identified by Kohlberg (Colby & Kohlberg, 1987). According to Beerthuizen and Brugman (2011) earlier studies have not been able to establish the hypothesized negative relationship between moral value evaluation and antisocial behavior, since both delinquents and non-delinquents rated moral values as 'important' as opposed to 'unimportant'. However when the extended operationalization was used - including the category 'very important' - a difference was found. Moreover, in contrast to the moral cognitive variables proposed by Barriga and colleagues (2001), moral value evaluation is theorized as an affective, more intuitive and impromptu elicitor, that indirectly – driving these moral cognitive processes – influences antisocial behavior. Beerthuizen and Brugman (2011) demonstrated that moral value evaluation positively related to both moral reasoning and moral identity, and negatively to self-serving cognitive distortions. This indirect relationship has been found earlier by Tarry and Emler (2007) and appeared to be the second largest predictor –after self-serving cognitive distortions – of externalizing behavior (Beerthuizen & Brugman, 2011). However, the causal nature of moral value evaluation still has to be empirically affirmed.

### **Present study**

The moral cognitive-process model of Barriga and colleagues (2001) is the first model that –embedded in a solid theoretical basis– aims to describe the relationships between various moral cognitive variables in relation to antisocial behavior and as a result furthers our understanding of antisocial behavior. However a few limitations are noteworthy.

First, Barriga et al. (2001) studied merely moral cognitive variables, not taking the affective component of morality into account. Recently Beerthuizen and Brugman (2011) postulated that the moral affective variable moral value evaluation would be the driving

force for these moral cognitive processes and demonstrated this was a valuable extension of Barriga's model since it appeared the largest indirect predictor of antisocial behavior.

Second, moral identity was measured with an adapted version of Arnold's (1993) Good-Self Assessment, which has not been psychometrically validated before. In an effort to overcome this limitation a multitrait-multimethod matrix will be developed, using both recognition and production measures, to examine the convergent and divergent validity of all constructs. Scores obtained from two different instruments measuring the same construct are expected to correlate higher with each other than scores of different constructs using similar measures (Campbell & Fiske, 1959).

Furthermore, although the relationships presented in Barriga's moral cognitive-process model (2001) are largely consistent with the theoretical literature, they are based on cross-sectional data only and therefore cannot account for the directionality of these relationships. All variables are measured twice within a one week interval, although with slightly different measures (i.e. production versus recognition), which enables us to give an indication of the stability and causality of the relationships among the morality variables and antisocial behavior.

Finally, the sample that Barriga and colleagues (2001) used consisted of college students that demonstrated low scores on antisocial behavior. In the present study a younger, more at risk adolescent population with varying educational backgrounds is used.

By using both recognition and production measures the present study aims 1) to present findings on convergent and divergent validity of all measures involved with a multitrait-multimethod approach, expecting the effect of trait to be stronger than the effect of method and 2) to extend the moral cognitive-process model by adding moral value evaluation and strengthen the relationships using a confirmatory factor analysis to develop a latent variable model, since these measurement methods are expected to be complementary. Furthermore, multiple regression analyses will be carried out to indicate if the directionality of the associations is in accordance with the proposed model.



## **Method**

### *Participants*

The sample included 144 females and 151 males, aged 13 to 21 years ( $M = 15.66$ ,  $SD = 1.33$  years). Students attended grades 3, 4 or 5 of a secondary school – which equals year 10 to 12 in the British school system – in the highly urbanized central part of the Netherlands. Educational levels included junior prevocational secondary education, higher general secondary education and preparatory university education. These are the mainstream educational levels in the Netherlands. Since the junior preparatory vocational level ends after grade four, students in the first year of their middle prevocational school – sex ratio, and ethnicity being similar – were used as an alternative for fifth grade students from the other school levels. A small percentage (16%) belonged to a minority group, meaning that at least one parent had a different country of origin than the Netherlands. At the first administration 237 (80.3%) students were present and filled out the questionnaires, at the second administration 279 (94.6%) students did. In total 221 (74.9%) students participated in both administrations. Attrition can be explained by not all participants being able to attend or motivated for both administrations due to illness or extra-curricular activities (e.g., homework, make-up arrears). No differences were found on gender, age or ethnic background between those attending two meetings or only one. However, at the first time of measurement a higher percentage of participants with a vocational background did not attend.

### *Procedure*

The production and recognition measures were completed during two administrations with a one week interval in a classroom setting. First, the production measures were administered, to exclude the possibility that the provided answers in the recognition measures could influence the responses of the participants when filling out the production measures. Active consent was received from the school board and passive consent from the students.

## *Measures*

### Moral value evaluation and moral judgment

The Sociomoral Reflection Measure-Short Form Objective (SRM-SFO, Basinger, Brugman & Gibbs, 2007) is a recognition instrument (questionnaire) to measure moral judgment and moral value evaluation. The Dutch version includes 10 items that pertain to the values of contract, truth, affiliation, life, property, law and legal justice. Moral value evaluation was measured by rating the importance of these values along a 3-point Likert scale. In order to measure moral judgment, participants indicated whether the four justifications based on stage one (100) to stage four (400) were similar to a reason they would use themselves and which one was closest to their own. The average stage score was then used as a measure for moral judgment. Beerthuizen, Brugman, Basinger, and Gibbs (2011) reported sufficient reliability and validity for both moral value evaluation and moral judgment in samples of adolescents. In the current study Cronbach's alpha for the 10 moral value evaluation items was sufficient with .71, but the Cronbach's alpha of moral reasoning was low with .54.

As a production measure the Sociomoral Reflection Measure-Short Form (SRM-SF) (Gibbs, Basinger & Fuller, 1992; Dutch translation Zwart-Woudstra, Meijer, Fintelman, & van IJzendoorn, 1993) was used. Participants were asked to formulate their own moral reasoning. Studies carried out in 23 countries have reported acceptable to good reliability and validity (Gibbs, Basinger, Grime, & Snarey, 2007). For the present study the 10 items corresponding to the recognition measure (SRM-SFO) were used. The 10 items to measure moral value evaluation are the same as in the SRM-SFO. Cronbach's alpha of moral value evaluation was only .58. The average stage score was calculated with the highest stage rating for each item and represented in a Global Stage score. Cronbach's alpha was .64.

### Moral Identity

Moral Identity was measured using the Good-Self Assessment-Questionnaire (GSA-Q) of Barriga et al. (2001) as the recognition procedure. The GSA-Q aims to measure the centrality to the self-concept of moral traits or virtues. Based upon earlier research some moral traits were added to the USA traits list (de Klerk, 2010). Participants responded to

23 items along a 5-point Likert scale ranging from “this isn’t me” to “this is me”, including 10 moral (considerate, courageous, dependable, generous, helpful, honest, just, respectful, responsible, and sympathetic) and 13 non-moral traits (outgoing, energetic, hardworking, friendly, assertive, logical, athletic, creative, independent, intellectual, humorous, social and obedient). Additionally, participants were asked to rank three traits that applied to them most when around with parents and when around with friends. The total score was obtained by summing the number of moral values mentioned in the ranking procedure<sup>1</sup>. The GSA-Q demonstrated good reliability, Cronbach’s alpha for the moral traits was .77.

For the production procedure we used an instrument similar to Arnold’s (1993) GSA Pictorial-Self Task (GSA-PST), only now participants had to produce traits themselves. Participants were presented with two diagrams of three concentric circles, representing who they are when with their family and when with their friends, and asked to write down three traits in all three circles for both situations. The circles symbolized the varying degrees of centrality of the self from the most important qualities to their sense of self in the inner circle to the least important qualities in the outer circle. Moral traits in the inner and middle circle were awarded with 2 and 1 points respectively, however not when in the outer circle because participants viewed them as not really being part of their identity. When a moral trait was present in both diagrams in the same circle an extra point was given. The total score was the sum score of both circles and possible extra points. The total score was expected to correspond with the importance of moral values to the participant’s identity. Internal consistency (Cronbach’s  $\alpha = .62$ ) and interrater reliability (Cohen’s  $\kappa (30) = .76$ ) were acceptable.

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<sup>1</sup> Barriga et al. (2001) obtained a score by subtracting the mean score of the nonmoral items from the mean score of the moral items, with a positive total score indicating that moral values are an important aspect of one’s self schema. However, the validity of that score seemed to be considerably lower than the rankorder score, that is based on Arnold’s (1993) procedure. Johnston and Krettenauer (2011) used a residual score. Although this score showed somewhat better results, again the correlation with the production measure score was lower.

### Self-centeredness

To measure self-centeredness the Self-centeredness scale (SC, 9 items) of the How I Think questionnaire was used as a recognition measure (HIT, Barriga, Gibbs, et al., 2001; Dutch translation Nas et al., 2008). In addition the Anomalous Responding Scale (AR, 8 items) - designed to detect socially desirable, incompetent or otherwise suspicious responding – and 3 positive filler items were included. Participants responded to the 20 items in total along a 6-point Likert scale, ranging from strongly agree to strongly disagree. The HIT exhibited high test-retest and internal consistency reliability as well as overall high construct validity (Barriga, Gibbs et al., 2001; Nas et al., 2008). Cronbach's alpha for SC in the present sample was .77 and for AR .71.

Since there is no production task available to measure self-centeredness, a production measure was developed. We opted for a sentence completion task for triggering self-centered responses. Participants were asked to complete 20 sentences that had been derived from the original questions of the HIT used for the recognition measure. The instruction explicitly asked the participants while completing the sentences to think back to a situation in which they acted against social or moral norms. The SCS-items were awarded with 2 points if self-centeredness was present, indicating that the participant gave notion of the importance of participant's interests without considering the interests of others or consequences for the future. Only 1 point was given when the participant wrote down any restrictions, i.e. when the action depended on certain circumstances or the situation. The total score was obtained by adding up all points given to the self-centeredness items. The internal consistency (Cronbach's  $\alpha = .62$ ) as well as the interraterreliability (Cohen's  $\kappa(30) = .67$ ) in this sample proved to be sufficient.

### Antisocial behavior

Antisocial behavior was measured using the Antisocial Behavior Questionnaire (Leenders & Brugman, 2005). This questionnaire represents 12 law violations, divided in the three subscales: theft, aggression and vandalism. Participants responded along a 3-point Likert scale; 'never', 'once' or 'more than once'. Sub scores as well as a total score were calculated. The questionnaire has been used in several studies (cf. van der Velden et

al., 2010) and has shown good reliability and validity. Cronbach's alpha in this sample was .84 for the total scale.

The questionnaire was adjusted for this study to create a production measure as well. The production measure contained two open questions, to stimulate participants to report their behavior not allowed by law and their behavior that is allowed by law, but that violates other social rules (conventions). The participant was asked to write down these violations and how often they were committed. The total score was obtained by awarding each written down offense concerning theft, vandalism or aggression 1 or 2 points when committed once or more than once, irrespective of the severity of the offense. Interraterreliability Cohen's  $\kappa(30) = .86$ .

## **Results**

### *Descriptive outcomes*

Two MANOVAs were conducted for both the production and recognition measures to check for possible main effects of gender, grade and educational level. When corrected by social desirability the same results emerged. Due to the small percentage of ethnic minority students, ethnicity was not adopted in the analyses.

For the production instruments main effects were found for gender ( $F(5, 165) = 4.68, p = .001$ ) and educational level ( $F(10, 332) = 2.39, p = .01$ ). No interaction effects were found. Univariate analyses demonstrated significant gender effects on moral identity ( $F(1, 169) = 4.74, p = .03$ ), self-centeredness ( $F(1, 169) = 6.91, p = .009$ ) and antisocial behavior ( $F(1, 169) = 13.19, p = .000$ ). Female adolescents scored higher on moral identity, whereas male adolescents scored higher on self-centeredness and antisocial behavior. For educational level, a significant effect was found for moral judgment ( $F(2, 169) = 10.74, p = .000$ ). Post-hoc tests demonstrated that pre-university students had a higher moral judgment stage score than pre-vocational and general higher secondary school students; no difference between the latter two was found.

Concerning the recognition instruments, main effects were found for gender ( $F(5, 25) = 8.94, p = .000$ ) and educational level ( $F(10, 50) = 3.56, p = .000$ ) as well. In addition an interaction effect was found between grade and educational level ( $F(20, 1008) = 1.89, p = .01$ ). Gender effects were found for self-centeredness ( $F(1, 253) = 12.42, p = .001$ ) and

antisocial behavior ( $F(1, 25) = 42.71, p = .000$ ); male adolescents scored higher on these variables. With respect to educational level, effects were found on moral judgment ( $F(2, 253) = 6.66, p = .002$ ), self-centeredness ( $F(2, 253) = 9.89, p = .000$ ) and antisocial behavior ( $F(2, 253) = 6.65, p = .002$ ). Post-hoc results for moral judgment corresponded with the production measure results. With regard to self-centeredness, pre-university students scored lower than students from the prevocational and higher general educational level. Whereas for antisocial behavior, pre-university students scored only lower than pre-vocational students. Finally, an interaction effect was found for moral judgment ( $F(4, 253) = 3.12, p = .016$ ) and antisocial behavior ( $F(4, 253) = 3.17, p = .014$ ) demonstrating an increase for prevocational students and a decrease for both higher general and pre-university students.

#### *MTMM analysis*

A multitrait-multimethod analysis was conducted to find out whether the effect of trait would be larger than the effect of method. The MTMM matrix can be found in table 1. Significant weak to moderate correlations, ranging from  $r = .25$  (moral judgment) to  $r = .58$  (moral value evaluation) were found between the production and recognition measures for the same trait. Notice that moral value evaluation was measured in the context of production or recognition measures, but that moral value evaluation itself was measured twice using the same recognition task. Furthermore, a method effect was found for the recognition instruments of self-centeredness and antisocial behavior ( $r = .51$ ), the correlation being higher than between the production and recognition measure of antisocial behavior ( $r = .49$ ). Also a higher correlation was found between the production measure of self-centeredness and the recognition measure of antisocial behavior ( $r = .41$ ) than between both types of measurement for self-centeredness ( $r = .38$ ). When controlled for social desirability the method effect for the recognition measures disappeared. However the correlation between self-centeredness and antisocial behavior - measured with varying instruments - remained higher than between both types of measurement for self-centeredness.



**Table 1.** Multi-Trait Multi-Method matrix with Pearson correlations.

<i>Production</i>	1MVE	2MJ	3MI	4SC	5AB	6MVE	7MJ	8MI	9SC	10AB
1Moral Value Evaluation	X									
2Moral Judgment	.01	X								
3Moral Identity	.15*	.03	X							
4Self-Centered	-.18**	.06	-.10	X						
5Antisocial Behavior	-.14*	.10	-.09	.25**	X					
<i>Recognition</i>										
6Moral Value Evaluation	<b>.58**</b>	.06	.06	-.09	-.20**	X				
7Moral Judgment	.09	<b>.25**</b>	.12	-.20**	.01	.12	X			
8Moral Identity	.13	.00	<b>.45**</b>	-.01	-.10	.13*	.10	X		
9Self-Centered	-.27**	-.16*	-.20**	<b>.38**</b>	.27**	-.35**	-.24**	-.05	X	
10Antisocial Behavior	-.26**	-.04	-.17*	.41**	<b>.49**</b>	-.30**	-.22**	.01	.51**	X

\*  $p < .05$ , \*\*  $p < .01$

MVE = Moral Value Evaluation; MJ = Moral Judgment, MI = Moral Identity, SC= Self-Centered, AB = Antisocial Behavior.



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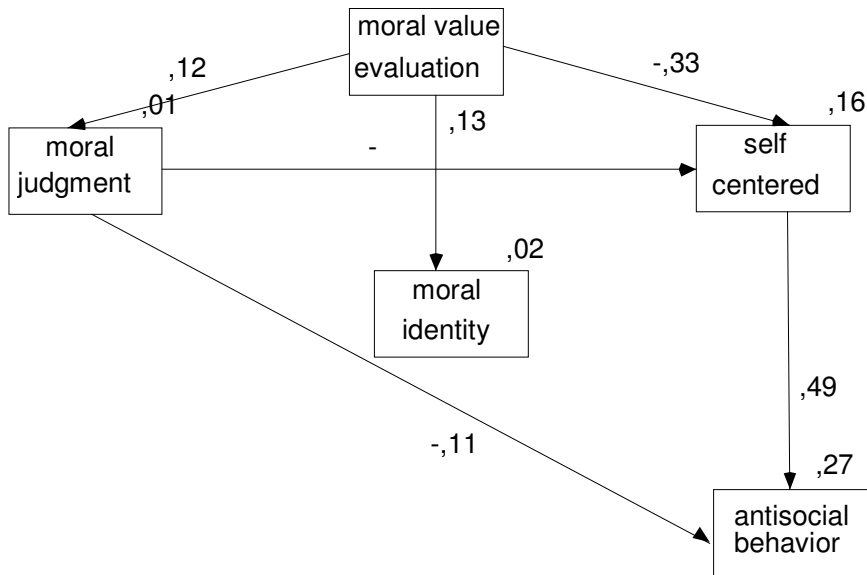
Furthermore, the recognition data demonstrated relationships among themselves. Moral value evaluation was positively related to moral identity and negatively to self-centeredness and antisocial behavior. Moral judgment showed negative associations to these constructs as well. However no relationship was found between moral judgment and moral value evaluation or moral identity, and for moral identity between self-centeredness and antisocial behavior. A positive association was apparent between self-centeredness and antisocial behavior.

Regarding the production data, moral value evaluation exhibited similar relationships, although less strong compared to the recognition data, likewise concerning the relationship between self-centeredness and antisocial behavior. However, no associations were found for moral judgment or moral identity.

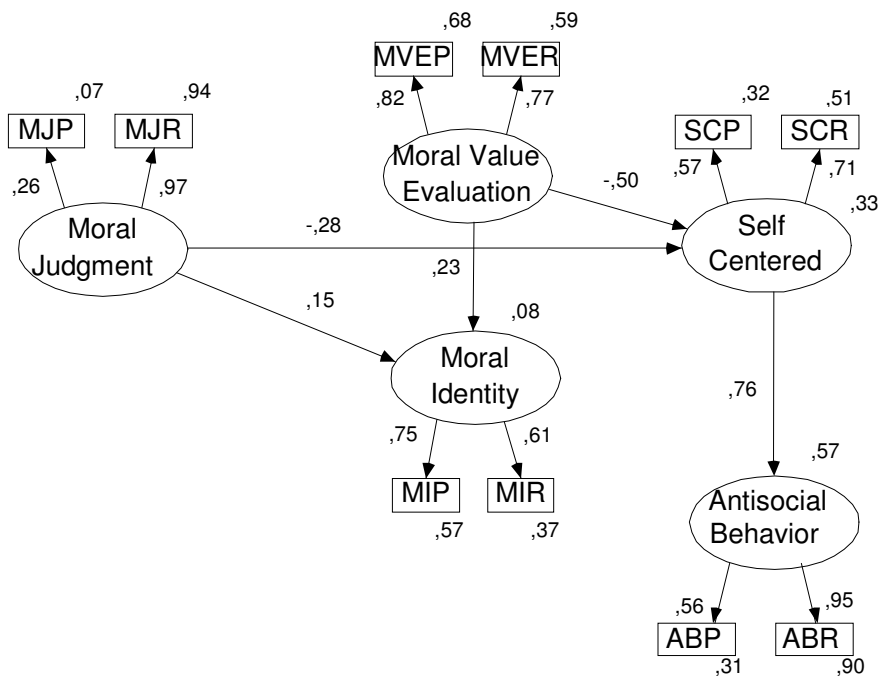
Using Confirmatory Factor Analysis (CFA) we tried to fit a model with method as latent variable (production vs. recognition tasks). The CFA failed, no acceptable solution could be found. In contrast, a CFA using the constructs as latent traits showed a good fit (see below). This confirms the status of trait as underlying variable over the status of method.

#### *Structural equation modeling*

In order to assess the strength of the relationships between moral judgment and antisocial behavior and the hypothesized mediating variables, two path analyses were carried out. First, it was attempted to replicate the model of Barriga et al. (2001) merely using data from the recognition measures. As shown in Figure 1, moral value evaluation indirectly related positively to both moral judgment and moral identity and negatively to self-centeredness. The relationship between moral judgment and antisocial behavior was partially mediated by self-centeredness. A mediation analysis demonstrated that when self-centeredness was included ( $\beta = .486$ ,  $t = 9.066$ ,  $p = .000$ ), the relation between moral judgment and anti-social behavior remained marginally significant ( $\beta = -.104$ ,  $t = -1.942$ ,  $p = .053$ ). In correspondence with Barriga et al. (2001) moral identity did not mediate this relationship, however contrasting with the results found by Barriga et al. (2001) moral identity did not show a direct, nor an indirect relationship via self-centeredness with antisocial behavior either. In total, 27% of the variance in antisocial behavior was explained, of whom self-centeredness was the strongest predictor.



**Figure 1.** Path analysis of moral cognitive variables in relation to antisocial behavior using only the data from recognition measures. Trimmed model. N = 295;  $\chi^2$  (4) = 9.13, p = .06; CMIN/df = 2.28; CFI = 0.96; RMSEA .066.



**Figure 2.** Confirmatory Factor Analysis of moral affective and cognitive variables in relation to antisocial behavior using production and recognition tasks. Trimmed model. N = 295,  $\chi^2$  (30) = 40.52, p = .095, CMIN/df = 1.35, CFI = .97, RMSEA = .035. (R = recognition task; P = production task.)

Second, in an attempt to strengthen the model of Barriga et al. (2001) a confirmatory factor analysis was executed, using latent variables based on the data from both recognition and production measures. The model fit was good. Together, the moral variables explained 57% of the variance in antisocial behavior. As presented in Figure 2, moral value evaluation - once more an indirect predictor - demonstrated a negative association with self-centeredness and a positive association with moral identity, but not with moral judgment. Self-centeredness fully mediated the relationship between moral judgment and with antisocial behavior. Again, moral identity did not show an indirect nor direct relationship to antisocial behavior, although a positive association with moral judgment was found. Consequently the model of Barriga et al., (2001) could be maintained, except for the relationships concerning moral identity.

#### *Multiple regression analyses*

Since the morality variables were measured twice with a one-week interval - using production measures at time 1 while using recognition measures at time 2 - multiple regression analyses were conducted to examine the stability and the direction of the relationships while taking the measurement at time 1 and social desirability into account as covariances. As presented in Table 2, all morality variables showed stability relationships of moderate strength, except for the low stability found for moral judgment. With respect to the causal relationships and corresponding to the extended model, both moral value evaluation and moral judgment measured at time 1 influenced self-centeredness at time 2, whereas self-centeredness at time 1 demonstrated the strongest influence on antisocial behavior at time 2. However, an interaction effect was found with gender ( $\beta = -.189$ ,  $t = -3.300$ ,  $p < .001$ ), demonstrating that self-centeredness at time 1 was a predictor of antisocial behavior at time 2 for boys ( $\beta = .425$ ,  $t = 5.421$ ,  $p < .001$ ), but not for girls ( $\beta = .131$ ,  $t = 1.301$ ,  $p = .197$ ). Furthermore a direct influence was found for moral value evaluation at time 1 and antisocial behavior at time 2.

**Table 2.** *Stability(1) and causal relationships, corrected for time 1 and social desirability(2) between morality variables and antisocial behavior.*

Relationships	N	$\beta$ (1)	t (1)	$\beta$ (2)	T (2)	R <sup>2</sup> (1)	$\Delta$ R <sup>2</sup> (2)
<b>(1) MVE1– MVE2</b>							
(2) MJ1 – MVE2	192	.606	10.501***	.038	.679	.367	.001
(2) MI1 – MVE2	217	.576	10.327***	-.051	-.918	.332	.003
(2) SC1 – MVE2	201	.589	10.294***	.060	1.011	.347	.003
(2) AB 1– MVE2	209	.559	9.698***	-.086	-1.459	.312	.007
<b>(1) MJ1 – MJ2</b>							
(2) MVE1 – MJ2	192	.251	3.572***	.045	.630	.063	.002
(2) MI1 – MJ2	192	.251	3.572***	.096	1.357	.063	.009
(2) SC1 – MJ2	178	.236	3.223**	-.129	-1.673	.056	.015
(2) AB1 – MJ2	184	.252	3.510***	.013	.171	.063	.000
<b>(1) MI1 – MI2</b>							
(2) MVE1 – MI2	216	.455	7.475***	.071	1.128	.207	.005
(2) MJ1 – MI2	192	.470	7.340***	-.006	-.086	.221	.000
(2) SC1 – MI2	200	.462	7.339***	.056	.838	.214	.003
(2) AB1 – MI2	208	.449	7.209***	-.042	-.647	.201	.002
<b>(1) SC 1 – SC2</b>							
(2) MVE1 – SC2	195	.387	5.830***	-.177	-2.882**	.150	.030
(2) MJ1 – SC2	172	.398	5.660***	-.153	-2.349*	.159	.023
(2) MI1 – SC2	195	.387	5.830***	-.110	-1.766	.150	.012
(2) AB1 – SC2	190	.377	5.578***	.117	1.767	.142	.012
<b>(1) AB1 – AB2</b>							
(2) MVE1 – AB2	208	.494	8.153***	-.157	-2.723**	.244	.024
(2) MJ1 – AB2	183	.488	7.515***	-.066	-1.067	.238	.004
(2) MI1 – AB2	208	.494	8.153***	-.083	-1.413	.244	.007
(2) SC1 – AB2	194	.510	8.212***	.264	4.393***	.260	.062

*Notes.* MVE = Moral value evaluation, MJ = Moral judgment, MI = Moral identity, SC = Self-centeredness, AB = Antisocial behavior. \* p < .05, \*\* p < .01, \*\*\* p , .001.

## **Discussion**

The present study contributed to the research examining the gap between moral judgment and antisocial behavior. In order to bridge the gap three mediating variables - moral identity, self-centeredness and moral value evaluation – were measured with two different sorts of instruments based on recognition versus production. The use of multiple instruments not only adds to the convergent and divergent validation of these instruments, but was also expected to lead to a more accurate estimate of the relationships between the constructs.

The first aim was to investigate whether the effect of trait was stronger than the effect of measurement method. The multitrait-multimethod analysis showed that the validity coefficients between the two measurement methods were all statistically significant and varied between low and sufficient. The highest correlation of .58 was found for moral value evaluation. In fact this was the same recognition measure administered twice, but administered in the context of the production or the recognition of moral judgment. In a way, this correlation shows the highest relationship that one may expect using class administration of measures with a one week time interval. Our hypothesis that the effect of trait is larger than the method effect can be accepted. Although a method effect was found between the recognition instruments of self-centeredness and antisocial behavior, this effect disappeared when social desirability was taken into account.

Nevertheless, a high correlation between self-centeredness and antisocial behavior remained. This points to problems with the operationalization of self-centeredness, or more broadly with the measurement of self-serving cognitive distortions. The operationalization of cognitive distortions includes the covert and overt categories of conduct disorder and oppositional defiant disorder derived from the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (APA, 2000): stealing, lying, aggression, and oppositional defiance. Consequently, the measure includes an implicit measurement of externalizing behavior. More neutral behavioral categories for self-centeredness would be preferable, particularly when using self-report measures for antisocial behavior (Brugman et al., 2011).

Another important finding concerning the convergent and divergent validity is that the production measures failed to replicate most of the relationships that were found with the recognition measures. Partly this may be attributed to the fact that some production measures were tested for the first time in this study. The absence of some relationships concerning moral identity in the present study – in contrast to the study by Barriga et al. (2001) – is most likely due to participants' age range of the sample. While Barriga et al. (2001) used college students, we used a sample with younger participants. As adolescence progresses, identity becomes more important and also more prominent.

Finally effects of background characteristics are relevant for the validity of the measures. Similar to the results reported by Barriga et al. (2001), female adolescents exhibited a stronger moral identity in the production procedure, whereas male adolescents showed a higher self-centeredness and a higher prevalence of antisocial behavior in both instruments. Individuals with a higher educational level reached a higher moral judgment stage in both types of measures and showed less self-centeredness and antisocial behavior in the recognition measure. Additionally, the recognition measure demonstrated an increase in antisocial behavior for older prevocational students, whereas a decrease was apparent for both older higher general and older pre-university students.

Although the convergent validity coefficients demonstrate that there is a certain overlap between the recognition and production instruments, some did better than others. For both self-centeredness and antisocial behavior the well-established recognition measures were better. Regarding antisocial behavior, a recognition measure would be more advisable, because when the respondents were asked to produce the answers themselves mostly traffic violations and alcohol/drug use were reported. With respect to moral identity however the production measure seems more promising. A possible explanation would be that a production procedure makes a stronger appeal to internalization. Concerning moral judgment, both instruments were weak, likely due to the poor reliability. Remarkable however, despite the questionable reliability and the rather weak relationships amongst the production measures, the contribution to explain antisocial behavior is extensive. Hence, they also seemingly supplement each other in some aspects.

The second aim was to extend Barriga's moral cognitive-process model by adding moral value evaluation as an affective component of morality and estimating the relationships more accurately with a latent variables model. In order to do this two path analyses were conducted in this study, one for which only the data from the recognition measures were used in order to make an exact replication of the model of Barriga et al. (2001) and the other for which both recognition and production measures were used to perform a Confirmatory Factor Analysis. Multiple regression analyses were carried out to assess the stability and see if the directionality of the relationships is in accordance with the second model.

Both models showed similar results. Except for the differences found in the relationships concerning moral reasoning, most likely due to the low stability found for moral judgment, also found by van der Velden (2010) using the same measure twice. Moreover, the second model was more powerful since it explained 57% of the variance in antisocial behavior as opposed to the 27% in the first model, using the same variables. When compared to the results found by Barriga et al. (2001) and Beerthuizen and Brugman (2011), these models are mainly corresponding. Self-centeredness and moral value evaluation - indirectly and to a lesser degree - exerted the strongest influence on antisocial behavior and mediated the relationship between moral reasoning and antisocial behavior. Moral identity proved to be an insignificant predictor of antisocial behavior in both models, as opposed to the moderate relationship found by Barriga et al. (2001) and the small relationship found for girls in Beerthuizen and Brugman (2011). A possible explanation is the age difference between the samples, which was mentioned earlier.

Multiple regression analyses confirmed the directionality of the relationships. The high stability of the relationships, suggests that the use of the different measurement methods does not form a threat for the causal direction of the relationships. A lower moral judgment level and less attributed importance of moral values causes more self-centeredness which increases antisocial behavior. In contrast to the results found by van der Velden et al. (2010) the primary cognitive distortion self-centeredness influenced antisocial behavior, and not vice versa. However, there is also a difference in time-framing (i.e., 4 months as compared to 7 days). Furthermore, self-centeredness interacted with gender in predicting antisocial behavior. The causal relationship between self-



centeredness and antisocial behavior was only evident for males, not for females. Small gender differences were also reported by van der Velden and colleagues (2010), who found a bidirectional relationship between cognitive distortions and antisocial behavior for girls. These contrasting results might be explained by a difference in primary and secondary cognitive distortions. Whereas the primary distortion self-centeredness is a strong predictor for antisocial behavior in boys, secondary distortions might be more important in explaining antisocial behavior in girls. Another explanation that could account for the influence of self-centeredness on antisocial behavior only found in boys, is that both self-centeredness and antisocial behavior were more prevalent in boys.

This study also had a few limitations. The most prominent limitation was that the reliability of some measures was low. Moreover, we used some measures that were constructed for the purpose of this study. Furthermore, only self-report measures were used, although social desirability was taken into account.

Another limitation concerns the restricted use of the self-centered scale of the How I Think Questionnaire. Although the results of self-centeredness in itself were mainly consistent with previous research on self-serving cognitive distortions and contributed even more strongly to the explanation of antisocial behavior, investigating the influence on the multiple moral process model separately for both primary and secondary distortions, could reveal a difference in relationships or according to gender. On the other hand, considering the exceeding results of self-centeredness and the high correlation found with antisocial behavior, it might be more powerful to use different measures of self-centeredness instead.

Finally, despite its wide range in age and educational background, the sample might have been too young to be able to account for the influence of moral identity and moreover cannot be generalized to the population of (incarcerated) delinquents.

In conclusion, the present study highlights the importance of using more than one instrument to measure a certain trait. The latent variables model obtained with measures based on production versus recognition, contributed to the explanation of antisocial behavior to an even larger extent than has been recognized before. Future research and clinical practice should especially focus on how to reduce the primary cognitive

distortion self-centeredness, rather than self-serving cognitive distortions in general. Moral identity however, proved to be an insignificant predictor in this younger sample.

Besides providing us with more accurate estimates of the strength of the relationships, the use of more instruments is of value in validating (already existing) instruments. Consequently, the present study demonstrated a higher correlation between self-centeredness and antisocial behavior measured with varying measurement methods than between both instruments for self-centeredness. Consequently, future research should adopt instruments with more neutral behavioral categories for self-centeredness in order to investigate if the dominant influence of self-centeredness in explaining antisocial behavior will remain.

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