



# Social skills training (SST) effects on social information processing skills in justice-involved adolescents: Affective empathy as predictor or moderator

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## ABSTRACT

**Objectives:** To examine the influence of affective empathy on post-treatment effects on social information processing of an outpatient individual social skills training for justice-involved adolescents.

**Methods:** The sample consisted of juveniles who received Tools4U, a social skills training with a parental component, as a penal sanction ( $N = 115$ ). Propensity score matching was used to select a control group of juveniles receiving treatment as usual (TAU) of  $n = 108$  juveniles (of a total  $N = 354$ ). Affective empathy was examined as a moderator and predictor of treatment effects on social information processing skills: hostile intent attribution and cognitive distortions.

**Results:** Empathy only influenced treatment effects on hostile intent attribution, and not on any of the other social information processing skills (i.e., cognitive distortions). Tools4U was only effective in improving hostile intent attribution for juveniles with moderate or high affective empathy and not for juveniles with low empathy. No moderating or predictive effects were found for cognitive distortions.

**Conclusions:** Affective empathy only influenced (Tools4U) treatment effects on hostile intent attribution: a minimum level of empathy may be required to decrease hostile intent attribution in treatment. The intervention proved to be effective in decreasing cognitive distortions (i.e., self-centering, assuming the worst), regardless of affective empathy level. Future studies should investigate and refine the complex interaction of affective empathy with other factors and treatment changes, particularly for long-term effects on delinquency.

## 1. Introduction

Social skills training (SST) is often used in the prevention and treatment of juvenile delinquency (Lipsey, Howell, Kelly, Chapman, & Carver, 2010). Improving social cognitive skills is one of the main aims of SST (Gresham, 2002; Gresham, Cook, Crews, & Kern, 2004; Merrell & Gimpel, 1998). As is shown that social cognitive skills deficits play an important role in the onset and persistence of juvenile antisocial behavior (Dodge, Coie, & Lynam, 2006; Dodge & Frame, 1982; Gibbs, 2013; Slaby & Guerra, 1988), addressing these is one important aspect of juvenile delinquency prevention and treatment. Reducing social skills deficits by means of SST is therefore assumed to reduce (the risk of) offending.

One individual SST for justice-involved juveniles that is carried out in The Netherlands is Tools4U. It is a relatively brief and 'light' intervention, applied as a penal sanction, specifically intended for adolescent onset delinquents with moderately severe delinquency trajectories

(Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998). Through this training, risk factors for delinquency, prosocial developmental task related skills and positive parental involvement are targeted (Albrecht & Spanjaard, 2011). Its training protocols are well-described, and a previous study has shown that the training is executed with sufficient treatment integrity (Van der Stouwe, Asscher, Hoeve, Van der Laan, & Stams, 2017). Moreover, in line with the small treatment effects found in most SST's ( $d = 0.28$ – $0.63$ , Ang & Hughes, 2002; Cook et al., 2008; Lösel & Beilmann, 2003), Tools4U has shown to be effective in reducing post-treatment impulsivity ( $d = 0.31$ ), and social information processing skills: self-centering ( $d = 0.28$ ), assuming the worst ( $d = 0.41$ ), and hostile intent attribution ( $d = 0.42$ , Van der Stouwe, Asscher, Hoeve, Laan, & Stams, 2016). In a follow-up study, no effects on re-offending were found, although the effects on reoffending within 6 months, and violent reoffending were large enough to expect them to reach significance in a larger sample (Van der Stouwe et al., 2017).

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However, in the past decades it has become increasingly important to not just determine whether interventions like Tools4U are effective, but to determine for whom and under which conditions they are effective (Kazdin, 2007; Kazdin, 2008; Kraemer, Frank, & Kupfer, 2006; Kraemer, Wilson, Fairburn, & Agras, 2002). The *responsivity* principle in particular suggests that juvenile justice interventions should match the learning style and abilities of its' participants to be effective (Andrews & Bonta, 2010; Andrews, Bonta, & Hoge, 1990; Andrews, Bonta, & Wormith, 2011; Andrews & Dowden, 2007). Consequently, it is important to understand for whom and under which conditions treatment effects can be obtained. In the present study, we therefore expanded the previous Tools4U effectiveness study (Van der Stouwe et al., 2016), by conducting predictor and moderator analyses to help better indicate for whom this intervention is most effective.

One factor that has been known to influence amenability to treatment is empathy. In general, two types of empathy are distinguished: affective empathy which is considered the ability to experience and share the emotions of others, and cognitive empathy, the ability to understand the emotions of others (Mehrabian & Epstein, 1972). In the present study, we investigated the influence of only affective empathy because it is considered a relatively static trait, which is not targeted by the frequently applied cognitive-behavioral approach in juvenile justice interventions and/or SSTs. Moreover, affective empathy in particular is considered to be the core characteristic of callous-unemotional (CU) psychopathic traits (Hare & Neumann, 2005; Van Leeuwen, Rodgers, Gibbs, & Chabrol, 2014). Juveniles with these CU traits are less susceptible to treatment, and more likely to (violently) reoffend (Dadds et al., 2009; Frick & Hare, 2001; Högström, Enebrink, & Ghaderi, 2013; Mulloy, Smiley, & Mawson, 1999; Salekin, 2002; White, Frick, Lawing, & Bauer, 2013), which has been attributed to a difficulty to train and improve empathy (Jolliffe & Farrington, 2007).

It is likely that empathy influences (SST) treatment effects because empathy has been found to interact with social information processing skills to predict antisocial behavior (Carlo et al., 2012; Chabrol, Goutaudier, Melioli, Van Leeuwen, & Gibbs, 2014; Thoma, Friedmann, & Suchan, 2013; Van Leeuwen et al., 2014). This is particularly relevant given the fact that improving social cognitive skills is an important target of SST. A possible explanation for the influence of empathy on (SST) treatment effects can be found in the theoretical foundation for its central aim of improving social cognitive skills: the Social Information Processing (SIP) model of social adjustment (Crick & Dodge, 1994; Dodge, 1985).

According to the SIP model, behavioral responses to social situations are processed in six steps: (1) encoding of external and internal cues, (2) interpretation and mental representation of those cues, (3) clarification or selection of a goal, (4) response access or construction, (5) response decision, and (6) behavioral enactment (Crick & Dodge, 1994, p. 76). Arguably, the wrong interpretation of social cues in Step 2 could lead to antisocial behaviour (e.g., delinquency) in Step 6. This is particularly plausible, because a relation between biased social interpretation skills, such as cognitive distortions and hostile intent attribution, and externalizing behavior has been repeatedly demonstrated (Helmond, Overbeek, Brugman, & Gibbs, 2015; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Consequently, and in line with the generally cognitive-behavioral approach of most SSTs (Cook et al., 2008), Step 2 is an important target in SSTs when employed as a juvenile justice intervention. That is, SSTs are thought to reduce (re)offending behavior (in part) through improving the preceding cognitive interpretation processes.

However, cognitive processing is not the only factor affecting a juvenile's behavioral responses to the social environment and social adjustment (Arsenio & Lemerise, 2004; Hoffman, 2000; Lemerise & Arsenio, 2000). Lemerise and Arsenio (2000) therefore have suggested to integrate emotional processes in the SIP model (in addition to the included cognitive processes). According to this integrated model (Lemerise & Arsenio, 2000), affective cues from peers, emotion

recognition, and empathic responsiveness play an important role in the encoding of social cues (i.e. Step 1, Crick & Dodge, 1994). These emotional processes precede and interact with the interpretation of cues (i.e. Step 2, Crick & Dodge, 1994), including causal and intent attributions and other interpretive processes. Consequently, emotional processes (Step 1) could facilitate or hamper the acquisition of social interpretation skills (Step 2) in treatment of antisocial behavior.

To our knowledge, no studies have been conducted examining the influence of empathy on treatment change for treatment targeting social cognitive skills. The aim of the present study is therefore to test the treatment implications of the integrated SIP model (Lemerise & Arsenio, 2000) by examining the influence of emotional processes (i.e., affective empathy, Step 1) on SST Tools4U treatment effects on social interpretation skills (i.e., cognitive distortions and hostile intent attribution, Step 2). This study could help to determine generalizability of treatment outcomes, to specify target groups for treatment delivery, and to gain insights to understand and improve treatment effectiveness (MacKinnon, 2011). We will distinguish between *predictive* and *moderating* effects of empathy. That is, in case of a *predictive* effect, the level of empathy predicts outcome effects without taking (treatment) condition into account, while a *moderating* effect specifies for which level of empathy the experimental treatment shows treatment effects (Kraemer et al., 2002).

Although the interaction between empathy and social cognitive skills has been investigated in previous research, the moderating or predictive influence of empathy on treatment effects on social information processing skills remains unclear. First, we hypothesized that a lack of affective empathy at pretest (i.e., not caring about others) will correspond with a lack of social information processing skills (Lemerise & Arsenio, 2000), particularly because it may represent more severe (developmental) problems, such as psychopathy or CU-traits (Berkout, Gross, & Kellum, 2013). It would then be no surprise that the present relatively light and brief SST would not contribute to changes in juveniles with CU-traits. Here, if a lack of social information processing skills serves to neutralize affective empathy when behaving antisocially (as suggested by Barriga, Gibbs, & Potter, 2001; Gibbs, 2013), we would expect less social information processing skills in juveniles with higher affective empathy at pretest, which also leaves more room to change for treatment. Finally, we expected to find no treatment effects in juveniles with low affective empathy, and the largest treatment effects in juveniles with high affective empathy.

## 2. Methods

### 2.1. Participants

As described by Van der Stouwe et al. (2016), the treatment group consisted of all juveniles ( $N = 115$ ) who received SST Tools4U in The Netherlands between May and August 2012. This treatment group was matched to a control group ( $N = 108$ ) of juveniles with a community service order or another behavioral training order (treatment as usual, TAU). Both groups completed questionnaires on social skills and treatment integrity immediately after the first (T1) and last (T2) meeting of treatment. The comparison group was abstracted from  $N = 354$  control group juveniles by means of propensity score matching based on gender, age, ethnicity and all pre-test outcome scales (for an elaborate description, see Van der Stouwe et al., 2016).

The majority of the sample were boys ( $n = 159$ , 71%), and the juveniles were of an average age of  $M = 15.71$  ( $SD = 1.53$ ) years. Half of the juveniles had a Dutch ethnicity ( $n = 111$ , 50%). Of the ethnic minority group, most had a non-Western background (Total: 87%; Turkey:  $n = 10$ , 9%; Dutch Antilles:  $n = 17$ , 15%; Morocco:  $n = 22$ , 20%; Surinam:  $n = 22$ , 20%; Other:  $n = 24$ , 21%). Over half received their sentence for a property offense ( $n = 66$ , 30%) or person offense ( $n = 63$ , 30%), with an average of  $M = 31.74$ ,  $SD = 25.82$  sentenced hours. Table 1 shows the distribution of gender, ethnicity, offense and

**Table 1**  
Characteristics of Tools4U and TAU group after propensity score matching.

Affective empathy level	Tools4U			TAU		
	<i>M (SD) or n (%)</i>			<i>M (SD) or n (%)</i>		
	Low	Moderate	High	Low	Moderate	High
Number of participants	29	61	25	30	52	26
Gender						
Male	27 (24)	47 (41)	10 (9)	28 (26)	39 (36)	8 (7)
Female	2 (2)	14 (12)	15 (13)	2 (2)	13 (12)	18 (17)
Age	15.59 (1.55)	15.84 (1.58)	15.64 (1.47)	15.67 (1.63)	15.81 (1.61)	15.50 (1.27)
Ethnicity						
Native Dutch	15 (13)	33 (29)	12 (10)	13 (12)	23 (21)	15 (14)
Ethnic minority	14 (12)	28 (24)	13 (11)	17 (16)	29 (27)	11 (10)
Index offense						
Property	11 (10)	19 (17)	18 (16)	8 (7)	13 (12)	7 (7)
Public order	2 (2)	6 (5)	3 (3)	6 (6)	5 (5)	2 (2)
Person	11 (10)	19 (17)	15 (13)	7 (7)	15 (14)	6 (6)
Weapon	2 (2)	2 (2)	2 (2)	2 (2)	0 (0)	1 (1)
Other (non-violent)	2 (2)	3 (3)	1 (1)	2 (2)	2 (2)	1 (1)
Truancy	1 (1)	12 (10)	6 (5)	5 (5)	17 (16)	9 (8)
Sentenced hours	40.07 (42.82)	32.44 (22.94)	30.48 (25.92)	28.43 (26.63)	31.00 (19.29)	27.27 (16.09)

Note. *M* = Mean, *SD* = Standard Deviation.

sentenced hours per level of empathy for both treatment conditions.

## 2.2. Treatment conditions

Juveniles in the treatment group received Tools4U, an outpatient individual SST imposed as a (penal) sanction for juveniles who have committed an offense (Albrecht & Spanjaard, 2011). The training is intended for delinquent juveniles (12 to 18 years) for whom lack of cognitive and social skills is related to delinquent behavior. Inclusion and treatment integrity were sufficient according to the 60%-standard of Durlak and DuPre (2008); Van der Stouwe et al. (2016).

Control group juveniles received any usual treatment other than Tools4U. The vast majority ( $n = 102$ , 94%) received a community service order, and the remaining juveniles received another behavioral training sentence ( $n = 6$ , 6%) with duration, training hours, and training intensity similar to Tools4U; that is, an individual aggression regulation training ( $n = 5$ , 5%) or individual substance abuse training ( $n = 1$ , 1%). In the Netherlands, these are imposed independently, without an accompanying probation order (although some juveniles receive an additional specific probation, both with and without probation guidance).

## 2.3. Outcomes and measures

### 2.3.1. Affective empathy

To measure empathy, juveniles were asked to fill out the Basic Empathy Scale (BES, Jolliffe & Farrington, 2006; Van Langen, Stams, & Wissink, 2012). This 20-item questionnaire with a 5-point scale ranging from 1 = *strongly disagree*, to 5 = *strongly agree* measures both cognitive and affective empathy. The subscale affective empathy (i.e., feeling what the other feels;  $\alpha T1 = 0.74$ ;  $\alpha T2 = 0.71$ ) was used.

### 2.4. Social information processing skills

In the present study, social information processing skills were measured by means of hostile intent attribution and cognitive distortions. To measure hostile intent attribution, the hostile intent subscale of the Social Information Processing and Emotional Response Questionnaire Short Version (SIP-AEQ, Coccaro, Noblett, & McCloskey, 2009) was used. The SIP-AEQ consists of vignettes about social situations with direct or relational aggression. Three vignettes were used in the present study. For every situation, juveniles could indicate on a 4-

point scale how likely or unlikely (1 = *very unlikely*, 4 = *very likely*) they thought different motivations or the situation behaviors were. Because the two scales of hostile intent, direct and indirect hostile intent, separately proved to be unreliable, it was decided to group them under one overarching scale of hostile intent ( $\alpha T1 = 0.77$ ;  $\alpha T2 = 0.81$ ).

Various cognitive distortions were measured using the How I Think Questionnaire (HIT, Barriga et al., 2001; Nas, Brugman, & Koops, 2008). The HIT consists of 54 items that can be answered on a 6-point scale ranging from 1 = *strongly disagree*, to 6 = *strongly agree*. The following cognitive distortions were assessed: self-centering ( $\alpha T1 = 0.79$ ;  $\alpha T2 = 0.83$ ), blaming others ( $\alpha T1 = 0.75$ ;  $\alpha T2 = 0.78$ ), minimizing/mislabeling ( $\alpha T1 = 0.80$ ;  $\alpha T2 = 0.83$ ), and assuming the worst ( $\alpha T1 = 0.79$ ;  $\alpha T2 = 0.80$ ).

### 2.5. Analytic strategy

We checked for (the absence of) treatment effects and significant changes between pre- and post-test for affective empathy. No significant treatment effects or significant changes were found. Next, we analyzed correlations between affective empathy, hostile intent attribution and cognitive distortions to determine dependence of affective empathy with social cognitive skills at baseline. Then, ANCOVA's were performed, adding affective empathy as a factor, to test whether affective empathy is predictor and/or moderator of social cognitive skills. Similar to the previous study (Van der Stouwe et al., 2016), the degree of urbanization and the number of weeks between pre- and post-test were included as covariates to control for the differences on these variables between the Tools4U and control group after matching.

The sample was divided in a group of "low", "moderate", and "high" affective empathy, using the lowest quartile of the scores to indicate "low affective empathy" and the highest quartile of the scores to indicate "high affective empathy" (see e.g., Wootton, Frick, Shelton, & Silverthorn, 1997). This approach is common when examining moderator effects in effectiveness research (see e.g., Holmbeck, 1997; Manders, Deković, Asscher, Van der Laan, & Prins, 2013). The remaining juveniles with scores above the lowest and under the highest quartile were considered the "moderate affective empathy" group. A similar number of participants per treatment condition was in the separate empathy level groups (Tools4U, low  $n = 29$ , moderate  $n = 61$ , high  $n = 25$ ; TAU, low  $N = 30$ , moderate  $N = 52$ , high  $N = 26$ ). There were no significant differences in distribution of "low", "moderate",

and “high” scoring juveniles between Tools4U and TAU for affective empathy.

We used a trichotomy of empathy, as literature suggests that treatment effects may vary for the extreme poles of empathy (Dadds, Cauchi, Wimalaweera, Hawes, & Brennan, 2012; Högström et al., 2013; White et al., 2013). As hypothesized, low empathy may result in the worst treatment outcomes, whereas juveniles with high empathy may show better treatment effects. In addition, it is in line with existing literature about risk and protective factors for juvenile delinquency, which frequently uses either the negative or positive pole of predictive factors (see e.g., Lösel & Farrington, 2012). Finally, an ordinal division allows for better practical use of the outcomes. That is, using a cutoff point for low and high empathy will better guide recommendations about for whom the intervention is appropriate and for whom it is not.

Each analysis examined the main effects of affective empathy and the interaction effects of affective empathy × condition. As advised by several scholars (Kraemer et al., 2002; Supplee, Kelly, MacKinnon, & Barofsky, 2013; Wang, Lagakos, Ware, Hunter, & Drazen, 2007) a significant interaction effect indicated that empathy was a moderator, while a significant main effect without a significant interaction effect indicated that empathy was a predictor.

When empathy was determined to be a moderator, post hoc analyses were conducted by splitting the file according to empathy level and again conducting an ANCOVA. These analyses yielded effect sizes indicating the improvement in the Tools4U group relative to the control group for each level of empathy separately.

### 3. Results

#### 3.1. Preliminary analyses

##### 3.1.1. Correlations between affective empathy and social information processing skills

Table 2 shows that affective empathy was negatively related to all cognitive distortions (self-centering:  $r = -0.20, p < .01$ ; blaming others:  $r = -0.16, p < .05$ ; minimizing/mislabeling:  $r = -0.22, p < .01$ ; assuming the worst:  $r = -0.14, p < .05$ ). There was no significant correlation between affective empathy and hostile intent attribution ( $r = -0.03, p = ns$ ).

#### 3.2. Testing hypotheses

##### 3.2.1. Affective empathy as a predictor and moderator of treatment effects on social information processing skills

Table 3 summarizes analyses for predictive and moderating effects

**Table 2**

Means, standard deviations, and correlations of affective empathy and social information processing skills.

	Affective empathy level			<i>r</i>
	Low <i>M</i> ( <i>SD</i> )	Moderate <i>M</i> ( <i>SD</i> )	High <i>M</i> ( <i>SD</i> )	
Affective empathy	2.35 (0.35)	3.20 (0.25)	4.10 (0.31)	
Hostile intent attribution	12.68 (3.51)	12.47 (3.03)	12.55 (3.69)	-0.03
Cognitive distortions				
Self-centering	2.43 (0.82)	2.46 (0.77)	2.00 (0.70)	-0.20**
Blaming others	2.57 (0.98)	2.46 (0.71)	2.21 (0.68)	-0.16*
Minimizing/mislabeling	2.46 (0.82)	2.37 (0.78)	1.98 (0.58)	-0.22**
Assuming the worst	2.48 (0.77)	2.51 (0.70)	2.20 (0.60)	-0.14*

Note: *M* = Mean, *SD* = Standard Deviation, Low:  $n = 59$ , Moderate:  $n = 113$ , High:  $n = 51$ ,  $r$  = correlation with affective empathy.

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 3**

Affective empathy as predictor and moderator of treatment effects on social information processing skills.

	Affective empathy			Status
	Empathy	Empathy × Intervention		
	<i>F</i>	<i>F</i>		
Hostile intent attribution	2.13	3.29*		Moderator
Cognitive distortions				
Self-centering	0.35	0.57		-
Blaming others	0.79	0.44		-
Minimizing/mislabeling	0.10	0.00		-
Assuming the worst	0.36	1.14		-

\*  $p < .05$ .

of affective empathy. Only one moderating effect was found on hostile intent attribution ( $F(2, 222) = 3.29, p < .05$ ). No moderator or predictor effects were found for any of the measured cognitive distortions.

#### 3.3. Post hoc analyses of predictor and moderator effects

Post hoc analyses were conducted to further examine the moderating effects of affective empathy on hostile intent attribution. Table 4 shows that juveniles with low affective empathy showed no Tools4U treatment effects on hostile intent attribution, whereas juveniles with moderate or high empathy showed significantly less hostile intent attribution after Tools4U compared to TAU (Moderate empathy:  $F(1,112) = 10.01, p < .01$ , High empathy:  $F(1,50) = 6.20, p < .05$ ).

### 4. Discussion

The present study expanded existing research on juvenile delinquency treatment by investigating the predictive and moderating effects of affective empathy on SST treatment effects. Furthermore, the present study tested the practical implications of integrating emotional processes in the SIP model (Lemerise & Arsenio, 2000) through the influence of empathy (encoding of cues, SIP step 1) on treatment effects on social information processing skills (interpretation of cues, SIP step 2). Empathy only influenced treatment effects on hostile intent attribution. That is, Tools4U was only effective in improving hostile intent attribution in juveniles with moderate or high affective empathy and not in juveniles with low empathy. Furthermore, affective empathy did not influence treatment effects on cognitive distortions, and Tools4U proved to be effective in decreasing cognitive distortions (i.e., self-centering, assuming the worst), regardless of affective empathy level.

These findings are only partially in line with our expectations. First, as expected, treatment did not reduce hostile intent attribution in juveniles with empathy deficits, whereas treatment did have a positive effect on the reduction of hostile intent attributions in juveniles showing high levels of empathy. Hostile intent attribution and affective empathy were not significantly related at pre-test, which is in contrast with our hypothesis that a lack of affective empathy is associated with more hostile intent attribution. This could mean that affective empathy does not influence hostile intent attribution directly, but that a minimum level of affective empathy is a prerequisite for decreasing (i.e., treating) hostile intent attribution. In terms of the integrated SIP model (Lemerise & Arsenio, 2000), juveniles need a certain ability to encode social cues (SIP step 1) to improve the interpretation of those cues (SIP step 2). Moreover, the lack of treatment effects for juveniles with low affective empathy is in line with previous research that found less treatment effects in juveniles with callous-unemotional traits (Dadds et al., 2012; Högström et al., 2013; White et al., 2013).

Second, we did find significant relations between affective empathy and all cognitive distortions at pretest, but these were not in the expected direction. As suggested earlier, we expected juveniles with

**Table 4**  
Means and standard deviations for the moderator effects of hostile intent attribution.

Hostile intent attribution	Tools4U				TAU				F
	N	T1	T2	Adjusted M	N	T1	T2	Adjusted M	
		M (SD)	M (SD)			M (SD)	M (SD)		
Low empathy	29	12.62 (3.53)	13.59 (4.33)	13.37	30	12.73 (3.54)	13.17 (3.45)	13.37	0.00
Moderate empathy	61	12.62 (3.32)	12.43 (2.94)	12.42	52	12.29 (2.66)	14.15 (3.17)	14.16	10.01**
High empathy	25	12.84 (3.37)	11.28 (3.80)	11.26	26	12.27 (4.02)	13.42 (2.93)	13.44	6.20*

Note: M = Mean, SD = Standard deviation, Adj. M = Adjusted mean, mean adjusted for covariates.

\*  $p < .05$ .

\*\*  $p < .01$ .

higher affective empathy to use more cognitive distortions to neutralize their empathy when behaving antisocially (as suggested by Barriga et al., 2001; Gibbs, 2013). Our results, however, showed exactly the opposite in that juveniles with higher affective empathy showed less and not more cognitive distortions. These outcomes are in accordance with the integrated SIP model (Lemerise & Arsenio, 2000): juveniles with better cue encoding skills (SIP step 1), show better cue interpretation skills (SIP step 2).

These findings did not, however, translate into a moderating or predictive effect of affective empathy on any on the cognitive distortions. Affective empathy is no prerequisite to (be able to) reduce cognitive distortions in treatment. Given that we found this for both distortions in which Tools4U showed treatment effects (i.e., self-centering, assuming the worst) as well as distortions in which Tools4U showed no treatment effects (i.e., blaming others, minimizing/mislabeling), this finding seems fairly robust. The cognitive approach of Tools4U therefore either requires minimum levels of affective empathy or is appropriately tailored to individual levels of affective empathy to facilitate treatment changes in cognitive distortions. Alternatively, the lack of predictive and moderating effects could be attributed to homogeneity of empathy in the Tools4U target population. That is, the moderately severe *adolescent onset* delinquents might all show adequate affective empathy with extremes (i.e., low empathy) not extreme enough to be of clinical relevance. Furthermore, psychopathic traits of which lack of empathy is a defining feature will generally lead to more severe delinquency trajectories (Carrasco, Barker, Tremblay, & Vitaro, 2006; Jolliffe & Farrington, 2004, 2007; McMahon & Washburn, 2003; Van Langen, Wissink, Van Vugt, Van der Stouwe, & Stams, 2014), excluding these juveniles from Tools4U. It could therefore be possible that the hypothesized influence of empathy on (changes in) cognitive distortions is only significant in more severe populations, or only with extreme lack of empathy and/or cognitive distortions.

Although this study has several methodological strengths, such as adequate treatment integrity and assessment of both the predictive and moderating role of affective empathy, some limitations need to be mentioned. First, the effects for the “low empathy” and “high empathy” groups were calculated on a smaller sample than for the “moderate empathy” group, which reduced statistical power to detect significant treatment effects in the extremes. Second, the transformation of a continuous variable into a group variable may have resulted in some loss of information. Third, we relied on sample specific distributions of empathy to define low and higher empathy groups, which may limit generalizability. However, given the fact that literature suggests that treatment effects may in particular vary for the extreme poles of empathy (Dadds et al., 2012; Högström et al., 2013; White et al., 2013), the present division in a larger ‘normal’ group and smaller ‘extreme’ groups would suit the data better than an even (trichotomous) distribution. Fourth, Levene’s test showed that there was significant heterogeneity of variances for hostile intent attribution. Given the complexity of the current statistical model (i.e., including both covariates and factors), we could not conduct (univariate) non-parametric

analyses to account for heterogeneity of variances. The outcomes of this analysis should therefore be interpreted with caution. Fifth, we were unable to examine whether treatment effects of affective empathy might differ depending on other relevant characteristics due to a lack of statistical power. For instance, girls in general show more affective empathy than boys (e.g., Allemand, Steiger, & Fend, 2015), and investigating the influence of gender on the current outcomes would be particularly interesting. Gender was, however, equally divided between the treatment and empathy groups, making it unlikely that the current outcomes could be a reflection of gender differences. Finally, based on the current study no statements can be made about the influence of empathy on Tools4U treatment effects on long-term and/or delinquency outcomes. Additional studies including long-term (recidivism) data are therefore needed to make a definite statement on the effectiveness of Tools4U and the influence of empathy on the treatment effects.

Taken together, the current study indicated that affective empathy only influences (Tools4U) treatment effects on hostile intent attribution. A minimum level of empathy seems required to decrease hostile intent attribution in treatment, which is in line with a SIP model that includes empathy (Lemerise & Arsenio, 2000). In contrast to this model, affective empathy did not influence treatment effects on cognitive distortions, and Tools4U proved to be effective in decreasing cognitive distortions (i.e., self-centering, assuming the worst), regardless of affective empathy level.

Further research should be conducted to determine the role of affective empathy in the prediction and moderation of treatment effects, particularly for long-term effects on delinquency. As juveniles with low affective empathy showed less treatment effects in the current study, Tools4U treatment effects could be improved by excluding these juveniles. Before the assignment of juveniles to Tools4U, their level of empathy should be assessed and a minimal level of empathy should be considered conditional for referral to the intervention. Future studies should investigate and refine the complex interaction between affective empathy and other factors to be able to tailor treatment to the needs of juveniles with low levels of affective empathy (thus improving treatment effectiveness with the current target population).

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