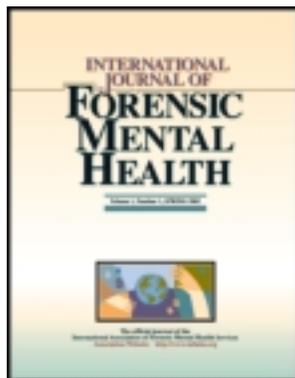


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Study on the Effectiveness of Responsive Aggression Regulation Therapy (Re-ART)

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This article describes a pre-test/post-test quasi-experimental study of the effectiveness of *Responsive Aggression Regulation Therapy* (Re-ART), a Dutch intervention for 16- to 21-year-old juveniles. Re-ART aims to decrease severe aggressive behavior using a cognitive behavioral approach combined with drama therapeutic and mindfulness techniques. Re-ART differs from other mental health interventions in criminal justice settings in its combination of individual therapy and group training, and in the flexibility to adjust the intensity and content of the treatment to the specific individual needs of juvenile delinquents. The sample consisted of violent offenders treated in a juvenile justice institution: 63 were in the experimental group (Re-ART) and 28 in the Treatment-As-Usual (TAU) group. Results indicate that Re-ART is significantly more effective than TAU in reducing the juveniles' recidivism risk, aggressive behavior, irrational cognitions, poor coping skills and improved responsiveness to treatment.

Keywords: adolescents, aggression problems, treatment, juvenile justice institutions, moderate or high recidivism risk

Statistics in the Netherlands show that the overall number of youth crimes has decreased in the last decade, but that the number of *violent* youth crimes has increased (Tollenaar, Van Dijk, & Alblas, 2009). Notably, the successful treatment of violence and other types of severe aggressive behavior is difficult (American Academy of Child and Adolescent Psychiatry, 2005). This applies even more when aggression problems have led to detention (Andrews & Bonta, 2010; Landenberger & Lipsey, 2005), partly because detention can reinforce aggressive behavior (Gatti, Tremblay, & Vitaro, 2009). Additionally, most juveniles in detention have severe and persistent aggression problems that are associated with mental disorders and other psychiatric problems

(Vreugdenhil et al., 2004) and with high recidivism risk. Vreugdenhil and colleagues (2004) postulate that the combination of conduct disorder (CD) and oppositional deficit disorder (ODD) with psychiatric problems impacts the effects of treatment. Furthermore, some youngsters seem unsuitable for group therapy, because group learning is too threatening for them or because they are sensitive to negative peer group influences (Dodge, Dishion, & Lansford, 2006; McGloin et al., 2008), which can lead to negative outcomes (aggressive behavior increases; Dodge et al., 2006).

Meta-analyses conducted by Lipsey, Landenberger and Wilson (2007) and McGuire (2008) have shown that the effectiveness of interventions targeting serious and persistent criminal behavior increases if treatment is intensive and partly individualized. Common evidence-based group interventions, like Aggression Replacement Training (Goldstein, Glick, & Gibbs, 1998) and EQUIP (Gibbs, Potter, & Goldstein, 1995; Leeman, Gibbs, & Fuller, 1993) are not

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individualized. In addition to the common evidence-based group interventions, there is a need for an intensive, largely individualized, and responsive type of treatment, which takes into account the specific needs and learning style of individual juveniles. Incarcerated juveniles with moderate and high recidivism risks may respond positively to treatment if specific possibilities and restrictions are taken into account that have been designated as the What Works principles of effective judicial interventions (i.e., the Risk-Need-Responsivity [RNR] model, Andrews & Bonta, 2006). Essentially, the RNR model assumes that the duration and frequency of treatment should be matched to the offender's risk to re-offend (risk-principle) and should target criminogenic factors (need-principle). The third principle (responsiveness-principle) consists of two aspects: general and specific responsivity. General responsivity indicates that the most effective techniques should be used to change criminogenic needs. Specific responsivity means that the intervention should be tailored to the abilities and strengths of the offender.

Responsive Aggression Regulation Therapy (Re-ART) is a newly developed responsive intervention that offers treatment to juvenile delinquents to decrease their aggressive behavior (Hoogsteder, 2007). The key factor that distinguishes Re-ART from other interventions for aggressive youth is that it is largely individualized and based on all of the principles of the RNR model, but especially the specific responsivity principle (Andrews & Bonta, 2010). Although the specific responsivity principle is considered to be an essential part of the RNR model, the principle has attracted little attention in research so far (Andrews & Bonta, 2010; Kennedy, 2001). The specific responsivity principle focuses attention on characteristics of juveniles that influence their ability to learn within a therapeutic situation. To meet the principle of specific responsivity, Re-ART emphasizes that the therapist must consider the personality (Andrews & Bonta, 2003; Kennedy, 1999), intellectual capacity, cognitive and social skills possibilities (Serin & Kennedy, 1997), motivation for treatment (Menger & Krechtig, 2008), and learning style (Andrews 1999; Andrews & Bonta, 2003) of the client. To increase the juvenile's responsiveness (to treatment) of Re-ART, obstructive factors, such as demotivation, distrust, attention deficits and low-impulse control, are dealt with as well.

Re-ART uses an integrative explanatory model that is based on the Transactional Model (Sameroff & Fiese, 2000) and the theory of Social Information Processing (SIP; Crick & Dodge, 1994; Dodge, 2006). Transactional theory posits that an individual's development is the product of ongoing bidirectional influences on the child or adolescent and his or her environment (Sameroff & Fiese, 2000). Aggression problems are therefore thought to originate from a transactional process in which child factors, in particular cognitive distortions, and socialization factors, including attitudes, values and morals, play an important role (Granic & Patterson, 2006). SIP asserts that antisocial behavior is the product of inadequate or disturbed social information processing. In this process, children and adolescents receive and read informa-

tion from their environment and prepare to respond to social cues in five steps. Each step of the process transacts with the individual's environment (Fontaine, 2006). From a transactional point of view, the displayed reaction/behavior leads to social consequences that inform future SIP.

Re-ART uses cognitive-behavioral techniques because international research has shown that Cognitive Behavioral Therapy (CBT), more than other therapeutic elements, effectively reduces aggressive behavior in juvenile delinquents (Litschge, Vaughn, & McCrea, 2010; Polaschek & Reynolds, 2001). Furthermore, meta-analyses (Landenberger & Lipsey, 2005; Lipsey et al., 2007; McGuire, 2008) have shown that developing cognitive skills, such as cognitive restructuring (recognizing and adapting adequate rational cognitions), training interpersonal problem-solving skills, are the key effective elements of cognitive-behavioral interventions for offenders. Sukhodolsky, Kassinove, and Gorman (2004) found that cognitive-behavioral therapies using role-playing games, imitation, and feedback are more effective in reducing aggression than cognitive-behavioral therapies that do not include these elements. Finally, Landenberger and Lipsey (2005) argued that CBT should focus on stress reduction (also see Novaco, 2001; Novaco, Ramm, & Black, 2001), impulse control, and emotion regulation to achieve positive outcomes. Apart from cognitive-behavioral techniques, Re-ART also uses drama-therapeutic techniques (role-playing games in order to practice perspective taking and problem-solving skills), and customized mindfulness exercises (in order to practice paying attention and non-judgmental observation) (Himelstein, Hastings, Shapiro, & Heery, 2012) in which attention is paid to motivating the juveniles and increasing self-efficacy (Bandura, 1997).

The present study examined the effectiveness of Re-ART using a pre-test-post-test quasi-experimental design with a waiting list comparison group that received Treatment As Usual (TAU). A part of both the experimental and comparison group received YOUTURN, which became part of the standard treatment program in all judicial residential settings in the Netherlands while the data for the current study were collected (September 2009). YOUTURN consists of competence-focused group care and EQUIP (Leeman et al., 1993). Since EQUIP is considered an evidence-based treatment (Leeman et al., 1993), possible effects of EQUIP on Re-ART were controlled for. The main hypothesis was that the Re-ART group would show lower risk for violent recidivism, less aggression, less inadequate attitudes and cognitions related to antisocial and aggressive behavior, better coping skills, and greater responsiveness to treatment in terms of treatment motivation and trust than the TAU group at post-test, while controlling for pre-test differences in these outcome variables. Based on the results of previous studies (De Swart et al., 2012; Weisz, Jensen-Doss, & Hawley, 2006), we assumed that TAU would produce generally little or no effect. Furthermore, we expected that a combination of EQUIP and Re-ART would lead to greater effects than Re-ART alone.

METHOD

Participants

The sample consisted of two groups of incarcerated juvenile offenders in a secure Dutch juvenile justice institution (JJI): the experimental Re-ART group ($n = 63$) and the TAU group ($n = 28$). A subset received elements of CBT (i.e., working with ABC-model: “as I think, so I feel and do”); Re-ART: 3.2%, $n = 2$, TAU: 14.3%, $n = 4$) and art therapy (i.e., creative therapy, music and drama therapy; Re-ART: 49.2%, $n = 31$, TAU: 85.7%, $n = 24$). All art therapists targeted self-image, emotions, and social interaction (especially situations that elicit aggressive behavior), but they did not use any form of established manualized treatment. The experimental and control group received EQUIP as a standard intervention during the course of their stay in the institution since September 2009.

A total of 28.6% ($n = 26$) of the juveniles had a Dutch background, 25.3% ($n = 23$) were of Moroccan origin, 14.3% ($n = 13$) were Surinamese, 7.7% ($n = 7$) were Turkish, and 6.6% ($n = 6$) had a Dutch Antillean background. Of the remaining juveniles, 3.3% ($n = 3$) were categorized as “other: western” and 14.3% ($n = 13$) as “other: non-western.” A series of chi-square tests and t -tests were conducted to determine if the TAU group differed significantly from the Re-ART group on various background variables (age, gender, cultural background), mental disorders (oppositional defiant disorder, conduct disorder, or attention deficit hyperactivity disorder), mental disability, substance abuse, impulse control, offense type, duration of treatment, frequency of treatment, length of stay in the residential setting, receiving EQUIP, dropout rate, treatment motivation, and social desirability (Table 1). The groups differed significantly in length of stay; Re-ART: 20 months; TAU: 11.9 months) and gender (Re-ART: 6.3% female, $n = 4$; TAU: 28.6% female, $n = 8$). The TAU group committed less serious violent offenses than the Re-ART group. A total of 26.9% ($n = 17$) of the experimental group stayed for at least two years, compared to 7.2% ($n = 2$) of the comparison group. However, despite the difference in length of stay, the TAU group did not differ significantly from the Re-ART group in duration and frequency of treatment.

T -tests were also used to determine if the TAU group differed significantly from the Re-ART group at pre-test on risk for violent recidivism, aggression, cognitive distortions, coping skills, and responsiveness to treatment. We found no significant differences.

Procedure

Re-ART was evaluated in a setting in which it is usually applied. Both groups received a more or less similar combination of interventions, designated as general group care, and art therapy. All data were collected between January 2007 and February 2011. Juveniles and staff respon-

TABLE 1
Characteristics Re-ART Group and TAU Group

	Re-ART ($n = 63$)	TAU group ($n = 28$)
Average age (by start intervention)	17.00 ($SD = 1.2$)	16.64 ($SD = 1.3$)
Gender (male)*	93.7% ($n = 59$)	71.4% ($n = 20$)
Average IQ	85.67 ($SD = 11.47$)	81.46 ($SD = 12.35$)
Immigrants	74.6% ($n = 47$)	64.3% ($n = 18$)
Received EQUIP	36.5% ($n = 23$)	39.3% ($n = 11$)
Average risk for recidivism pre-test (< is better)	1.75 ($SD = 0.44$)	1.64 ($SD = 0.49$)
Average motivation treatment pre-test (< is better)	1.24 ($SD = 0.73$)	1.39 ($SD = 0.69$)
Social desirability	3.35 ($SD = 0.80$)	3.37 ($SD = 0.81$)
Disorder/criminogenic factors		
CD (not significant)	47.6% ($n = 30$)	28.6% ($n = 8$)
ODD	38.1% ($n = 24$)	42.9% ($n = 12$)
ADHD	17.5% ($n = 11$)	7.1% ($n = 2$)
Minor impulse control	54.0% ($n = 34$)	39.3% ($n = 11$)
Mental disability	23.8% ($n = 15$)	28.6% ($n = 8$)
Substance abuse	38.1% ($n = 24$)	35.7% ($n = 10$)
Types of crimes		
Offense type 1: ability, possibly with violence	52.4% ($n = 33$)	50.0% ($n = 14$)
Offense type 2: medium to high violence	27.0% ($n = 17$)	21.4% ($n = 6$)
Offense type 3: (attempt to) murder	7.9% ($n = 5$)	14.3% ($n = 4$)
Duration and frequency		
Average duration of stay in month*	20.00 ($SD = 14.79$)	11.89 ($SD = 6.80$)
Average duration treatment in weeks	46.86 ($SD = 23.46$)	43.89 ($SD = 26.83$)
Average hour of treatment per week	1.72 ($SD = 0.72$)	1.41 ($SD = 0.73$)

* $p < .05$.

sible for the adolescent's treatment (e.g., mentor / tutor of the living group; not the therapist) filled in questionnaires during the intake and again after the conclusion of Re-ART or the program received by the TAU group (art therapy, CBT), and before aftercare; this resulted in pre- and post-intervention data. The average time between the pre- and post-test was 57 weeks for the Re-ART group and 44 weeks for the TAU group. Comparison group participants of the current study had an indication for Re-ART, but were placed on a waiting list without any specific reason other than no available place in the Re-ART group at the time. It was not possible for them to start later with Re-ART, because their stay in the institution was not long enough.

Four individuals in the Re-ART group and two individuals in the TAU group did not complete treatment due to a serious lack of motivation. However, since they completed the questionnaires on pre- and post-test, these data were included in the analyses.

Re-ART

Re-ART was developed for boys and girls aged 16 to 21 years with severe (life-course persistent) aggression regulation problems and a moderate to a (very) high recidivism risk (measured by the Structured Assessment of Violence Risk in Youth; Borum, Bartel, & Forth, 2002; see instruments). Re-ART focuses on both emotional and instrumental aggression. Re-ART contains several treatment components that can be combined with group training. The components that are offered are customized depending on the complexity of the criminogenic problems at the individual level (Needs principle). Re-ART assumes that juveniles with multiple static risk factors (e.g., previously violent behavior), cognitive distortions, or with comorbid mental disorders need more time to learn specific skills (Responsivity principle).

Re-ART offers the following standard treatment modules: Intake and Motivation, Aggression Chain (psycho-education for self-comprehension, relapse-prevention plan), Controlling Skills, Influence of Thinking, and Handling Conflicts. The optional modules focus on Stress Reduction, Impulse Control, Emotion Regulation, Observation and Interpretation, Assertive Behavior, and a module for the family (system).

Re-ART uses treatment techniques such as motivational techniques to improve the subjects' beliefs in their own abilities, psycho-education and making subjects aware of the negative consequences (for themselves) of their aggressive behavior (cost-benefit analysis). Re-ART used also 'imitation' (demonstrating examples of expected behavior) and exercises to differentiate, handle, and diminish negative emotions (by describing and observing the emotions), and Rational Emotive Therapy (awareness and changing of irrational thoughts). In order to reduce irrational thoughts, the adolescent is encouraged to take the perspective of another person who represents a contrasting (facilitative) way of thinking than that of the individual concerned. Re-ART also offered transfer-training (practicing correct behavior outside the residential setting) and indirect moral development exercises (e.g., taking perspective, making choices, thinking about consequences). While providing the treatment, the therapist should take a judgment-free attitude.

To be responsive, the treatment level can be adjusted to the intelligence, learning style, pace, preferred learning method (making the content easier or doing more exercises) and needs (optional modules or parallel treatment, like addiction care) of the subjects. The juvenile always receives individual training combined with a group module. The juvenile participates in the group module every other week, unless there is a contra-indication (e.g., bad behavior on the part of the juvenile in the group). Individual sessions take place at least once a week and last for at least one hour. Group training consists of at least 12 to 14 sessions and each session lasts one and a half hours. The emphasis is on individual treatment. The

start of the individual module 'Influence of Thinking' is also the start of the group module. The group module focuses on cognitive distortions that are associated with several themes, such as revenge and insulting family members. The duration of the total intervention (individual and group modules) can vary from half a year to about two years (Risk principle).

EQUIP

EQUIP uses CBT elements and is focused on motivating and teaching antisocial youth to think and act responsibly. EQUIP is thought to transform a negative peer culture into a positive culture, in which individuals feel responsible for each other and actually help one another (Gibbs et al., 1995). The primary focus of EQUIP is to stimulate adolescents to make their own morally acceptable decisions, and to improve anger management, correction of thinking errors, and prosocial skills (Knorth, Klomp, Van den Bergh, & Noom, 2007).

Instruments

Risk for Recidivism

Incarcerated juvenile judicial institutes in the Netherlands use the Structured Assessment of Violence Risk in Youth (SAVRY; Borum et al., 2002; Lodewijks, De Ruiter, & Doreleijers, 2003). In the current study, the SAVRY was also used to conduct risk assessments (pre- and post-treatment). Only youngsters with a moderate and high recidivism risk were referred for Re-ART. The SAVRY was collected as part of the Routine Outcome Monitoring and filled in (blind) by prison staff members (e.g., psychologists, not the therapists) who had a background in child studies and had finished a special training in administering, scoring, and interpreting the SAVRY.

The SAVRY consists of 24 items divided into three risk domains: historical risk factors (ten items; e.g., Abused as a Child), social/contextual risk factors (six items; e.g., Experiencing Stress and Poor Coping), and individual dynamic risk factors (eight items; e.g., Negative Attitude). Each risk item has a three-level rating structure with specific rating guidelines. The SAVRY provides an estimation of the risk for re-offending. For this study, the total risk score was used as an indication of the youth's risk level of re-offending with a violent offense. The SAVRY can also be used for measuring change on dynamic criminogenic risk factors.

The SAVRY was developed for adolescents from 12 to 18 years, but can also be used for young adults up to 21 years (Lodewijks, Doreleijers, De Ruiter, & Wit deGrouls, 2006). Several validation studies showed favorable psychometric properties of the SAVRY (e.g., Dolan & Rennie, 2008; Meyers & Schmidt, 2008). Significant correlations were found between the total risk score and violence and recidivism among young male offenders (Catchpole & Gretton, 2003; Lodewijks, Doreleijers, & De Ruiter, 2008). Meyers and Schmidt

(2008) found interrater reliability ranging from good to excellent.

Aggression

Aggressive incidents. Measurement of aggressive incidents in the institution was based on the data of aggression incidents registered by prison staff members in a computer program of a Dutch judicial registration system to describe the frequency and severity of aggressive incidents. We checked the data of the registered aggression incidents by the computer with the data of the regular incidents registration forms to be sure that all incidents had been registered in the system. The first measurement was after three months and subsequently after completion of Re-ART or TAU.

Aggression-related skills: Self-control, Assertiveness and Dealing with Anger. Cognitive (self-control) and social skills (assertiveness) related to aggression were assessed with the juvenile-report and mentor-report versions of the Re-ART List (Hoogsteder, 2012a). The Re-ART List assesses skills that are needed to decrease an aggression problem according to the theoretical model of Re-ART. These skills are divided into the Self-Control scale (10 items; juveniles: $T1 \alpha = .76$, $T2 \alpha = .77$, mentor: $T1 \alpha = .68$, $T2 \alpha = .74$) and the Assertiveness scale (8 items; juveniles: $T1 \alpha = .75$, $T2 \alpha = .78$, mentor: $T1 \alpha = .73$, $T2 \alpha = .74$). Each item is rated on a five-point Likert scale ranging from 1 (*This is not true at all*) to 5 (*This is completely true*). Examples of items from the mentor-report version are 'The juvenile is able to control his aggressive feelings' (Self-Control scale), and 'The juvenile handles conflicts in an assertive manner' (Assertiveness scale). The item of the SAVRY 'Dealing with Anger' was also used for measuring aggression.

Coping

The Utrecht Coping List (UCL; Evers, Vliet-Mulder, & Groot, 2000; Schreurs et al., 1993) was used to measure the way participants cope with stressful situations. The UCL is a self-report questionnaire and distinguishes seven coping styles. Four of these styles were used in the present study: Problem-Focused Coping (seven items; $T1 \alpha = .66$, $T2 \alpha = .70$), Palliative Coping (eight items; $T1 \alpha = .76$, $T2 \alpha = .73$), Social Support (six items; $T1 \alpha = .83$, $T2 \alpha = .74$), and Reassuring Thoughts (five items; $T1 \alpha = .65$, $T2 \alpha = .65$). Each item is rated on a four-point Likert scale ranging from 1 (*never*) to 4 (*very often*). The item Stress and Poor Coping of the SAVRY was also used for measuring coping. The UCL has sufficient reliability (Schreurs et al., 1993), construct validity, and predictive validity (Schaufeli & Van Dierendonck, 1992).

Cognitive Distortions

The 'Brief Irrational Thoughts Inventory' (BITI) and the 'How I Think' (HIT) questionnaire were used to measure cognitive distortions. The BITI is a self-report questionnaire that consists of 18 statements describing different kinds of irrational thoughts (Hoogsteder, 2012b). The BITI is subdivided into three subscales: Aggression and Justification (nine items; e.g., 'If someone touches me, I should hit him'; $T1 \alpha = .76$, $T2 \alpha = .72$), Sub-Assertiveness (five items; e.g., 'I think that people get angry with me because I often say 'No'; $T1 \alpha = .68$, $T2 \alpha = .69$) and Distrust (four items; e.g., 'Everyone is against me'; $T1 \alpha = .60$, $T2 \alpha = .60$). The Distrust scale is used for measuring responsiveness. Each item of the BITI is rated on a six-point Likert scale ranging from 1 (*I totally disagree*) to 6 (*I totally agree*). A recent study showed favorable psychometric properties of the BITI. Convergent, divergent, and concurrent validity were established, while measurement invariance was established for gender and ethnic origin (native versus non-native Dutch respondents) and by means of confirmatory factor analysis, supporting the construct validity of the BITI (Hoogsteder, 2012b).

The HIT is a self-report questionnaire and consists of 54 items that are to be answered on a scale of 1 (*I totally agree*) to 6 (*I totally disagree*) (Barriga, Gibbs, Potter, & Liao, 2001). The HIT is subdivided into four subscales (39 items) related to four behavioral categories of which two were used in the present study: Physical Aggression (10 items; $T1 \alpha = .73$, $T2 \alpha = .70$) and Opposition-Defiance (ten items; $T1 \alpha = .64$, $T2 \alpha = .57$). Eight items relate to the Anomalous Response scale to test social desirability ($T1 \alpha = .66$, $T2 \alpha = .60$), used in this study to compare the level of social desirability in answering of the Re-ART group and the TAU group. The Dutch version of the HIT demonstrated acceptable reliability and validity (Nas, Brugman, & Koops, 2008). Wallinius, Johansson, Lardén, and Dernevik (2011) showed that the convergent, discriminant, and predictive validity of the HIT were adequate, but that structural and divergent validity needed further examination. The item Negative Attitude (SAVRY) was also used for measuring cognitive distortions.

Responsiveness

Items of the SAVRY were used in order to assess changes in Motivation, Attention Deficits, and Impulsivity. The Distrust scale of the BITI was used to measure responsiveness to treatment.

Program Integrity

To preserve program integrity, juveniles who received treatment from an inexperienced therapist (less than 6 months experience with Re-ART, according to the Re-ART-guidelines) were excluded from this study ($n = 21$). Program integrity was regularly tested throughout the duration of the

study. One supervisor was responsible for maintaining the quality of treatment. The supervisor assessed to what extent the therapists met the Re-ART pre-conditions (e.g., caseload) and quality of delivery (e.g., whether the duration and intensity of the treatment satisfied the risk needs, and provision of aftercare according to the protocol). All therapists ($n = 7$) had a higher vocational education level and had completed the "Train-the-Therapists" course. The therapists all met the caseload requirement of at least three treatments, and they all provided Re-ART treatment for at least 12 hours a week. Furthermore, the therapists attended supervision meetings every other week.

Every two weeks, a multidisciplinary indication team, including a psychiatrist, social worker, and supervisor of Re-ART, discussed which treatment was indicated for (new) juveniles of the institution. This indication team also checked which juveniles met the substantive inclusion criteria of Re-ART. They were assigned to treatment conditions when they scored moderate or high on risk for recidivism, dealing with anger, stress and poor coping, and negative attitude (measured with the SAVRY; see instruments). Other indication criteria were placement in a juvenile justice institution because of severe aggression problems and aggressive behavior in different habitats. In 12 cases of the Re-ART group, it was decided to deviate from the inclusion criteria: seven juveniles in the Re-ART group were still 15 years old when they started the intervention, one juvenile had an IQ of 68, and four juveniles had an IQ of 69. These youngsters were admitted to Re-ART because the therapists, based on their clinical judgment, concluded that they had sufficient cognitive capacities to profit from the treatment. Also, the TAU group met the inclusion criteria of Re-ART, with the exception of two juveniles, one was 15.8 years old and one had an IQ of 69.

Treatment integrity across the entire treatment program was assessed by using reports of therapists, adolescents and the Re-ART supervisor. The evaluation forms were used to identify the treatment quality of relevant components of the Re-ART model. The forms included, amongst others, whether the RNR model and Re-ART techniques had been applied. The results showed that, according to the evaluation forms, the score was sufficient (only two components were scored lower than 90%); 81.8% of the mentors on the living group sufficiently supported the juveniles to achieve their goals set by the program. Additionally, 75.8% of the therapists scored positive on consultation and harmonization between treatment staff. Moreover, the juveniles of the Re-ART group also evaluated Re-ART, with a mean program rating of 7.3 on a 10-point rating scale.

Statistical Analyses

Expectation-maximization (EM; Do & Batzoglou, 2008) was used to estimate missing values that were considered randomly missing (6.4%). EM imputations preserve the rela-

tionship with other variables, but is only reasonable if the percentage of missing data is relatively small and if the standard errors of individual items are not large. In order to control for differences between the Re-ART and TAU group when evaluating the intervention effects, we conducted analyses of covariance (ANCOVA; Rausch, Maxwell, & Kelley, 2003). Differences in post-test scores between the groups were tested, controlling for pretest scores, gender and length of stay in the juvenile institution (using them as covariates in the ANCOVA). We also included EQUIP as a factor that may possibly moderate the effect of Re-ART. Effect sizes were computed in terms of Cohen's d , based on post-test means and standard deviations of the Re-ART and TAU group, corrected for pre-test means and standard deviations of these groups. Cohen (1992) categorized ES as follows: $.19 < d < .49 =$ small effect, $.50 < d < .79 =$ moderate effect, $d > .80 =$ large effect.

RESULTS

Risk of Recidivism and Aggressive Behavior

Table 2 shows, as expected, that the Re-ART group had a significantly lower violent recidivism risk and showed significantly less aggression than the TAU group, which is reflected by lower scores on Self-control Skills (reported by the mentors), aggression-related Assertiveness Skills (reported by the juveniles) and Dealing with Anger. The effects sizes (ES) ranged from $d = 0.84$ to $d = 2.36$, which can be considered as large effects (Cohen, 1992). A small effect ($d = 0.35$) was found for Aggression-related Assertiveness Skills (reported by the mentors).

There were no significant differences in the number of aggression incidents between the TAU group and the Re-ART group after three months (first measurement). However, a significant post-test difference was found: $F(1, 84) = 7.08$, $p = .009$, $d = 0.70$. Fewer incidents were registered in the Re-ART group than in the TAU group (measured during the treatment period). In both the Re-ART group and TAU group more aggression-incidents were registered in juveniles receiving EQUIP (main-effect): $F(1, 85) = 4.09$, $p = .05$. The means and standard deviations were as follows: Re-ART and EQUIP ($n = 23$, $M = 0.86$, $SD = 0.65$); TAU and EQUIP ($n = 11$, $M = 1.59$, $SD = 1.04$); Re-ART and no EQUIP ($n = 40$, $M = 0.60$, $SD = 0.66$); TAU and no EQUIP ($n = 17$, $M = 0.96$, $SD = 0.63$).

Coping Skills

We hypothesized that the Re-ART Group would show better coping skills than the TAU group at post-test. Table 3 shows that the Re-ART group scored significantly better than the TAU group on coping skills measured with the self-report questionnaire (UCL). The effects were large for Problem-Focused Coping, Palliative Coping, Social Support and

TABLE 2
Means, SDs and Effect Sizes Risk for Recidivism and Aggressive Behavior for Re-ART Group and TAU Group Pre- and Post-test

	Re-ART group					TAU group					Main effect	
	T1		T2		Adjusted <i>M</i>	T1		T2		Adjusted <i>M</i>	<i>F</i> (1, 84)	<i>ES</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
SAVRY												
Recidivism Risk	1.75	0.44	1.27	0.48	1.24	1.64	0.49	1.64	0.49	1.71	19.78**	1.01
<u>AR-list Juv.</u>												
Self-Control	23.27	4.50	33.44	2.58	33.66	24.57	4.10	26.07	3.22	25.52	240.14**	2.36
Assertiveness	22.73	4.03	27.01	2.43	26.59	20.82	4.01	21.93	3.43	22.88	75.48**	1.99
<u>AR-list Mentor</u>												
Self-control	19.60	3.68	31.75	2.89	31.71	19.93	3.73	26.07	3.32	26.15	51.41**	1.38
Assertiveness	15.56	3.01	19.11	2.40	18.62	13.39	2.38	16.32	2.76	17.43	4.08*	0.35
<u>SAVRY</u>												
Dealing with Anger	1.87	0.34	1.08	0.52	1.08	1.89	0.32	1.54	0.51	1.54	14.52**	0.84

* $p < .05$, ** $p < .001$.

Reassuring Thoughts. Based on the risk assessment scores with the SAVRY, a moderate effect was found for Stress and Poor Coping.

We found a significant interaction effect, $F(1, 84) = 6.87$, $p = .01$, between Re-ART and EQUIP on Palliative Coping, indicating that the effect of Re-ART was somewhat different, i.e., larger, when juveniles received EQUIP, $t = -8.08$, $p < .001$, than when juveniles did not receive EQUIP, $t = -9.17$, $p < .001$. The means and standard deviations were as follows: Re-ART and EQUIP ($n = 23$, $M = 25.91$, $SD = 2.59$); TAU and EQUIP ($n = 11$, $M = 19.27$, $SD = 3.58$); Re-ART and no EQUIP ($n = 40$, $M = 24.98$, $SD = 2.43$); TAU and no EQUIP ($n = 17$, $M = 20.59$, $SD = 3.60$). These results indicate that Re-ART compensates for the negative effect of EQUIP on Palliative Coping.

Cognitive Distortions

Table 4 shows the results of the ANCOVA for Cognitive Distortions. We hypothesized that the Re-ART group would show more improvement in Cognitive Distortions than the TAU group. There was a significant post-test difference for

the HIT and the BITI. The effects were large for the BITI Aggression/Justification scale, and the HIT Physical Aggression and Opposite Behavior scales. For the BITI Sub-Assertiveness scale a moderate effect was found. There were no significant differences on Negative Attitude (SAVRY). EQUIP showed a significant main effect at post-test, $F(1, 84) = 4.28$, $p = .04$. In both the Re-ART group and the TAU group the score on Negative Attitude was higher (negative) for juveniles receiving EQUIP than those not receiving EQUIP. The means and standard deviations were as follows: Re-ART and EQUIP ($n = 23$, $M = 1.30$, $SD = 0.47$); TAU and EQUIP ($n = 11$, $M = 1.45$, $SD = 0.52$); Re-ART and no EQUIP ($n = 40$, $M = 1.20$, $SD = 0.41$); TAU and no EQUIP ($n = 17$, $M = 1.24$, $SD = 0.44$).

Responsiveness

The ANCOVA showed, as expected, that the Re-ART group scored better than the TAU group on responsiveness (Table 5). The effects were small to moderate for Motivation and Attention deficits, and medium to large for Suspicion and Impulsivity.

TABLE 3
Means, SDs and Effect Sizes Coping Skills for Re-ART Group and TAU Group Pre- and Post-test

	Re-ART group					TAU group					Main effect	
	T1		T2		Adjusted <i>M</i>	T1		T2		Adjusted <i>M</i>	<i>F</i> (1, 84)	<i>ES</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
UCL												
Problem-solving	17.97	3.58	21.65	2.35	21.64	17.36	3.89	17.75	2.98	17.78	87.72**	1.37
Palliative Coping	20.38	4.54	25.32	2.51	25.23	19.90	4.51	20.07	3.59	20.26	128.18**	1.73
Social Support	12.38	4.27	16.13	2.39	15.88	11.00	3.01	12.82	2.31	13.38	98.29**	1.05
Reassuring Thought	12.57	3.01	14.40	2.47	14.35	12.40	3.36	11.86	2.91	11.97	46.88**	0.92
<u>SAVRY</u>												
Stress and Poor Coping	1.56	0.50	1.17	0.49	1.17	1.61	0.48	1.46	.51	1.49	7.77**	0.49

** $p < .001$.

TABLE 4
Means, SDs and Effect Sizes Cognitive Distortions for Re-ART Group and TAU Group Pre- and Post-test

	Re-ART group					TAU group					Main effect	
	T1		T2		Adjusted <i>M</i>	T1		T2		Adjusted <i>M</i>	<i>F</i> (1,84)	<i>ES</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
BITI												
Aggression	33.21	8.48	24.41	4.81	24.07	30.00	7.19	29.14	5.09	29.91	99.00**	1.38
Subassertive	12.98	5.66	11.14	3.72	11.29	13.21	3.60	13.25	3.24	12.91	23.13**	0.55
HIT												
Oppositional Behavior	3.03	0.70	2.48	0.43	2.46	2.89	0.66	2.82	0.53	2.86	47.48**	0.95
Physical Aggression	3.14	0.80	2.40	0.48	2.37	2.88	0.72	2.95	0.54	3.02	111.99**	1.45
SAVRY												
Negative Attitude	1.52	0.50	1.24	0.43	1.23	1.46	0.51	1.32	0.48	1.33	1.21#	0.30

** $p < .001$.

DISCUSSION

The main focus of this study was to examine the effectiveness of Re-ART using a quasi-experimental design with a waiting list comparison group receiving TAU. The results showed that Re-ART was significantly more effective than TAU in reducing violent recidivism risk, aggressive behavior, inadequate coping skills and cognitions (except for negative attitude), and increasing the juvenile's responsiveness to treatment. Most of the effects were moderate to large. The effects were only small for aggression-related social skills, which may be explained by the daily social skill training received by both the experimental and comparison group. The results of this study confirm the findings of Landenberger and Lipsey (2005), showing that violent adolescent offenders can be successfully treated, at least in the short term, as measured by a variety of scales, staff ratings and institutional behavior.

The effects on aggression related skills and irrational cognitions were larger when assessed by adolescent self-report than by prison staff report. This may be caused by an inflation of positive scores on the aggression-related skills in the Re-ART group due to socially desirable responding (Youngstrom, 2008). It is possible that juveniles in the Re-ART group are more sensitive to socially desirable responding in the domain of aggression related skills, because

they regularly practice and evaluate these skills during Re-ART treatment sessions. With regard to differences in scores on irrational cognitions (negative attitude), staff members are likely to observe different types of criminal behavior, whereas the adolescents only refer to their cognitions related to aggressive behavior, which are much more specific.

The current study was carried out under clinically representative conditions; that is, both groups received a more or less similar combination of interventions, designated as general group care and art therapy. Moreover, the institutional living group climate may have influenced the effects of the treatment of both groups, affecting treatment motivation, empathy and locus of control of the young inmates (Van der Helm, Klapwijk, Stams, & Van der Laan, 2009). It was, however, possible to examine the degree to which EQUIP, an established treatment for juvenile delinquents, affected outcomes of Re-ART, because only part of the juveniles received EQUIP.

We expected that EQUIP, in combination with Re-ART, would lead to greater effects than Re-ART alone. The results of this study showed that EQUIP in combination with Re-ART only produced better results in terms of Palliative Coping. Unexpectedly, EQUIP had a negative effect on aggression incidents and negative attitudes (both groups). In this case, a selection effect is unlikely, since delivery of EQUIP

TABLE 5
Means, SDs and Effect Size on Responsiveness to Treatment for Re-ART Group and TAU Group Pre- and Post-test

	Re-ART Group					TAU Group					Main effect	
	T1		T2		Adjusted <i>M</i>	T1		T2		Adjusted <i>M</i>	<i>F</i> (1,84)	<i>ES</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
SAVRY												
Motivation for Treatment	1.24	0.73	0.48	0.54	0.49	1.39	0.69	0.86	0.76	0.83	5.31*	0.42
Distrust	14.25	5.02	11.90	3.33	11.74	13.14	2.93	13.36	2.39	13.73	25.36**	0.73
Attention Deficit	1.54	0.50	1.32	0.47	1.30	1.46	0.51	1.46	0.51	1.51	4.45*	0.45
Impulsivity	1.56	0.50	1.17	0.53	1.16	1.61	0.49	1.61	0.50	1.65	21.36**	0.73

* $p < .05$, ** $p < .001$.

became compulsory during the course of the intervention study. EQUIP did not show positive effects on behavioral outcomes in the Netherlands (Helmond, Overbeek, & Brugman, 2012). The negative outcomes of EQUIP may have been caused by a lack of treatment integrity, as Helmond and colleagues (2012) recently showed that the frequency and duration of EQUIP meetings and level of treatment adherence were insufficient in secure Dutch juvenile justice institutions. Also the high turnover rates in the EQUIP treatment group might have negatively influenced the results, since it takes time to develop a positive group culture, which is considered to be the backbone of the EQUIP program (Helmond et al., 2012). An unstable group could have had a negative impact on the peer culture. Possibly, the individual approach of Re-ART is more resistant to the negative effects of an unstable living/treatment group.

Andrews and Bonta (2003) showed that incarcerated juveniles with moderate and high recidivism risks respond positively to treatment if the treatment is based on the Risk-Need-Responsivity model. Re-ART is based on this model and especially focuses on the Responsivity principle. That is, there is consideration of the needs (individually and optional modules), personality, learning style, communication style and level and tempo of learning of the juvenile. These characteristics influence how juveniles respond to treatment. Furthermore, obstructive treatment factors, such as demotivation, distrust, attention deficits and low-impulse control, are also treated to increase responsiveness. Research on the role of responsivity in treatment is sparse. It is suggested that the Re-ART approach, especially through its focus on responsivity, can result in positive outcomes for the juveniles.

A few methodological limitations of this study should be taken into consideration. The main limitation concerns the sample size, which reduces the statistical power and restricts the generalizability of the findings. However, the target group of this study is small and difficult to reach. Furthermore, the number of juveniles in the experimental and control group were large enough to allow meaningful analyses. Second, the use of a quasi-experimental design is a limitation. We did not use randomization because ethical and organizational constraints made it impossible to conduct a true experimental study. The advantage of the current study, however, is that the juveniles in the TAU group were indicated for Re-ART but were placed on a waiting list without any specific reason other than no available place in the Re-ART group. A third limitation of this study is that it is unsure whether all relevant variables that can possibly influence the result of the intervention have been measured. Additionally, correction afterwards does not guarantee that the bias has been taken away adequately (Deeks et al., 2003). Finally, it should be acknowledged that the large number of comparisons made between the experimental and control group may have resulted in significant effects by chance alone. On the other hand, all outcomes that were examined represented different treatment goals and demonstrated moderate to large effects.

Re-ART was evaluated in the setting in which it is normally applied. Therefore, the results are probably generalizable to other correctional (residential) facilities (Nathan, Stuart, & Dolan, 2003). It is recommended, however, to interpret the results with reservations since this is the first study on the effectiveness of Re-ART with a relatively small sample size. Notwithstanding these limitations, the current study goes beyond previous research by showing that Re-ART leads to a decrease in the juveniles' risk of recidivism and aggressive behavior, and improves coping skills, irrational cognitions, and responsiveness. Given the positive results of this study, the intervention seems promising for use within correctional facilities. Follow-up studies, for instance with actual recidivism data as outcome and conducted in other settings, could further add to the evidence confirming the effectiveness of Re-ART.

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