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### Late-adoptions in adolescence

Can attachment and emotion regulation influence behaviour problems? A controlled study using a moderation approach

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# Late-adoptions in adolescence: Can attachment and emotion regulation influence behaviour problems? A controlled study using a moderation approach

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## Abstract

A growing body of research suggests that, compared to normative adolescence, adoptive adolescence could be considered a specific risk condition characterized by more psychiatric problems, attachment insecurity, and emotional regulation difficulties as consequences of negative experiences in preadoption relationships. The current study explores (a) a moderation model of adoption status on the association between attachment representations (secure, dismissing, preoccupied, and disorganized) and behavioural problems and (b) a moderation model of adoption status on the association between emotion regulation processes (cognitive reappraisal and expressive suppression) and behavioural problems. Both the moderation models were controlled for verbal skills. Forty-six adopted adolescents and a control group of 34 nonadopted peers (12–16 years old) living with both their biological parents were assessed using the Friends and Family Interview, the Emotion Regulation Questionnaire for Children and Adolescents, the Child Behaviour Check List 6–18, and the verbal subtests of the Wechsler Intelligence Scale for Children, the latter as control measure. Results showed that adoption status (but not attachment) positively predicted externalizing and total behaviour problems, whereas attachment disorganization (but not adoption status) positively predicted internalizing problems in both groups. Moreover, low cognitive reappraisal had a negative impact on externalizing problems only for adopted adolescents, but not for nonadopted youths. The clinical implications of these findings are discussed in order to enhance effective intervention with adopted adolescents and their parents.

Keywords: adolescence; adoption; attachment; behaviour problems; emotion regulation

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## 1 INTRODUCTION

### 1.1 Adopted adolescents and psychopathology

One of the questions of greatest interest among scholars who deal with adoption is whether early experiences of abandonment, neglect, and institutionalization of adopted children can adversely affect their further development and adaptation or whether their experiences with adoptive parents can act as a protective factor from such negative outcomes<<Query: AUTHOR: The citation “Palacios & Broadzinsky, 2010” has been changed to “Palacios & Brodzinsky, 2010” to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: You right: the correct form is “Palacios & Broadzinsky, 2010”>> (Palacios & Brodzinsky, 2010; van der Voort et al., 2014). These attempts at adjustment are even more difficult in adolescence, as this transitional phase of development leads children to strong emotional, behavioural, and cognitive changes and may represent further risk factors (Coakley & Berrick, 2008; Rueter & Koerner, 2008). During adolescence, past negative experiences seem to increase the likelihood of developing several psychiatric problems and emotional difficulties (Colvert et al., 2008; van der Vegt, van der Ende, Ferdinand, Verhulst, & Tiemeier, 2009; Vandepoel, Roskam, Passone, & Stievenart, 2014), but the data on adjustment and the presence of behavioural problems in adopted adolescents are contrasting.

Some studies (Hjern, Lindblad, & Vinnerljung, 2002; Rueter, Keyes, Iacono, & McGue, 2009; Tieman, van der Ende, & Verhulst, 2005)<<Query: AUTHOR: The citation “Tieman, Van der Ende, & Verhulst, 2005” has been changed to “Tieman, van der Ende, & Verhulst, 2005” to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: You right, the change is fine. The correct form is “Tieman, van der Ende, & Verhulst, 2005”>> show that, as teenagers, internationally adopted children are from 1.5 to 4 times more likely to be diagnosed with various forms of mental health problems: They have an up to 3.6 times greater chance of committing suicide, a 2 to 3.6 times greater chance of being hospitalized for psychiatric problems, a 5 times greater chance of drug abuse, and a 2 to 3 times greater chance of committing a crime and of abusing alcohol compared to their nonadopted peers. Merz and McCall (2010) investigated behaviour problems of institutionalized adoptees, collecting data from a sample of 42 nondeprived adoptees (domestic adoption before the child age of 6 months), 97 children from high quality institutions, 899 adoptees with varied levels of deprivation, and 342 children from psychosocially but not physically depriving institutions. The sample was composed of adopted children divided according to their age at assessment (6–11 and 12–18 years old) and time since the adoption (less than 9, 9–17, and more than 18 months). Data showed the higher risk of attention and externalizing problems in adopted children institutionalized early, even in the absence of severe physical deprivation, compared to early-adopted children. Interestingly, there was a higher risk of behaviour problems in adolescence than in others age at assessment. In addition, another study (Von Korff, Grotevant, & McRoy, 2006) on 92 adolescents adopted during infancy showed that adolescent adoptees' reports of adjustment depend from the levels of contact with the birth families. Two recent longitudinal studies (van der Voort et al., 2014; van der Voort, Linting, Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2013)<<Query: AUTHOR: The citation “van deer Voort et al., 2014” has been changed to “van der Voort et al., 2014” to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: The change is fine. The correct form is “van der Voort et al., 2014”>> showed that children inhibition was an important predictor of withdrawn and anxious-depressed behaviour in adopted adolescents, and that those with lower levels of effortful control in childhood showed higher levels of aggressive and delinquent behaviours. A review (Hawk & McCall, 2010), comprising 18 studies on international adoptees assessed between 2.5 to 27 years old, confirmed that the adoptees' maladjustment showing a higher percentage of internalizing problems in younger internationally adopted compared to nonadopted children and a higher percentage of externalizing problems in older internationally adopted compared to nonadopted ones. Their conclusion regarding the relationship between age at assessment and behavioural problems highlights a greater degree of internalizing problems for younger adoptees compared to older adoptees and mixed results for externalizing, attention, and thought problems.

## Key Practitioner Message

- ~~Late-adopted adolescents, compared to nonadopted peers, reported lower somatic complaints, suggesting that they may not allow themselves to show physical vulnerability as consequence of their early affective experiences of severe deprivation.~~
- The adoption status (but not attachment representations) was found to be predictive of externalizing and total behaviour problems, suggesting that attachment itself is not the only variable to take into account in explaining possible maladaptive outcomes in late-adopted adolescents. Nevertheless, disorganized attachment positively predicted internalizing problems, being a risk factor for both adopted and nonadopted adolescents.
- Only for late-adopted adolescents, higher cognitive reappraisal was negatively related with externalizing problems, suggesting that the functional and positive ability to cognitively restructure negative situations may help them to reduce impulsive negative reactions towards others. Both increasing cognitive reappraisal and decreasing expressive suppression may be considered as valuable goals of therapy with adopted adolescents and their parents.\* Late-adopted adolescents, compared to nonadopted peers, reported lower somatic complaints, suggesting that they may not allow themselves to show physical vulnerability as consequence of their early affective experiences of severe deprivation\* Late-adopted adolescents, compared to nonadopted ones, reported higher level of expressive suppression strategies, which may be considered as an attempt to be compliant with the environment's requests in order to be loved, accepted, and nurtured

In contrast to these findings, other studies suggested that, although adoptees can show higher psychopathological risk compared to nonadoptees, the degree of this difference was rather low, and overall, most of the adoptees showed good psychosocial adjustment (Palacios & Brodzinsky, 2010). For example, Westhues and Cohen (1997), comparing the adjustment of 86 adopted adolescents (12–17 years) and 49 young adults (18–25 years) with that of their 65 nonadopted siblings raised in the same family, found that adopted adolescents showed good overall social adaptation, although their nonadopted peers showed higher levels of adaptation especially in terms of self-esteem, family relationships, and peer relationships. A 2003 meta-analysis (Bimmel, Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2003) compared 2,317 internationally adopted adolescents with their 14,345 nonadopted peers showing little differences between the two groups for externalizing, but not in internalizing, behaviour problems, and this was true for adopted female. A subsequent meta-analysis (Juffer & van IJzendoorn, 2005) on 25,281 adopted children and 80,260 controls showed that adoptees reported higher level of internalizing and externalizing problems, compared to nonadoptees, but the respective effect sizes were small.<sup>1</sup> Moreover, the international adoptees were divided according to the age of assessment in four groups: 7% of children aged 0 to 4 years, 44.5% of children aged 4 to 12 years, 44.5% of adolescents aged 12 to 18 years, and 4% of adoptees over the age of 18 years. Data showed no differences in externalizing and internalizing problems and fewer total behaviour problems in adopted adolescents compared to early and middle childhood adoptees. An Israeli study on 169 participants also showed that domestically adopted adolescents reported good adjustment and low levels of internalizing and externalizing problems (Gleitman & Savaya, 2011). Similarly, in a Chilean study (Escobar, Pereira, & Santelices, 2014) comparing 25 adopted adolescents to 25 nonadopted ones, no significant differences were found between the two groups in terms of behavioural problems.

On the basis of these contrasting results, there is an increasing interest, both in research and clinical studies, to explore the psychological factors favouring reduction of behaviour problems among at-risk youth, particularly late-adopted adolescents.

## 1.2 Attachment representations and behaviour problems in the adoption context

Several studies stressed that in adoptive families the quality of parent–child attachment relationships may represent a corrective experience with a positive impact on adopted children's adjustment, thus decreasing the onset of behaviour problems (Beijersbergen, Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2012; Lionetti, 2014; Molina, Casonato, Ongari, & Decarli, 2015; Pace, Di Folco, Guerriero, Santona, & Terrone,



2015; Pace, D'Onofrio, Guerriero, & Zavattini, 2016; Piermattei, Pace, Tambelli, D'Onofrio, & Di Folco, 2017; Steele et al., 2008; Steele, Hodges, Kaniuk, Hillman, & Henderson, 2003; Steele, Hodges, Kaniuk, & Steele, 2009b; Steele, Hodges, Kaniuk, & Steele, 2010; van der Voort et al., 2014).

From the attachment perspective, on the one hand, a wide body of literature suggests that adverse preadoption experiences foster the development of insecure and disorganized attachment representations in late-adopted children<<Query: AUTHOR: The citation "Escobar e Santelices, 2013" has been changed to "Escobar & Santelices, 2013" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: The change is fine. The correct form is "Escobar & Santelices, 2013".>> (Escobar & Santelices, 2013; Lionetti, Pastore, & Barone, 2015; Pace, Cavanna, Velotti, & Zavattini, 2014; Pace, Zavattini, & Tambelli, 2015b; van den Dries, Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2009). A meta-analysis (van den Dries et al., 2009) confirmed this hypothesis showing that children adopted after their first birthday were less securely attached than nonadopted children ( $d = 0.80$ ), and adopted children showed more disorganized attachment compared to their nonadopted peers ( $d = 0.36$ ), which the authors attributed to the children's experiences of maltreatment and neglect before adoption. These results were indirectly confirmed by maltreatment literature that showed that, compared to their control groups, maltreated children were more likely to be insecure and/or disorganized with respect to attachment patterns, with an effect size of 2.19 for disorganization in maltreated children compared to children from normative samples (Baer & Martinez, 2006<<Query: AUTHOR: The citation "Cyr, Euser, & van IJzendoorn, 2010" has been changed to "Cyr, Euser, Bakermans-Kranenburg, & Van IJzendoorn, 2010" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: The change is fine. The correct form is "Cyr, Euser, Bakermans-Kranenburg, & Van IJzendoorn, 2010".>>; Cyr, Euser, Bakermans-Kranenburg, & Van IJzendoorn, 2010).

On the other hand, a number of studies highlighted the role of adoptive families in promoting "earned" security in adopted children and adolescents. Recently, a study (Beijersbergen et al., 2012) on 125 early-adopted adolescents stressed that maternal sensitive support predicts a change in the attachment patterns, from insecurity in infancy to security in adolescence. In our previous study on 46 late-adopted adolescents and their mothers, a significant concordance between mothers and adolescents' secure/insecure attachment classifications was found (Pace et al., 2015). Finally, a study with a sample of 27 adoptive families showed that the presence of both maternal and paternal secure attachment representations corresponds to a more secure attachment presentation in adopted children (Molina et al., 2015). Higher scores in parental security correspond to higher parental competences in adoptive couples (Pace, Santona, Zavattini, & Di Folco, 2014; Pace, Santona, Zavattini, & Di Folco, 2015), which in turn were correlated to secure attachment in adolescents. Moreover, some studies on attachment representations of adolescent adoptees showed a percentage of secure attachment ranging between 32% and 63%, with a drastic reduction of disorganization under 2% (Barcons et al., 2012; Beijersbergen et al., 2012; Escobar & Santelices, 2013; Groza<<Query: AUTHOR: Ref. "Groza et al., 2012" is cited in text but not provided in the reference list. Please provide details in the list or delete the citation from the text. Ans: The correct citation is "Groza, Muntean, & Ungureanu, 2012". In the reference list, you can add the following details: Groza, V., Muntean, A., & Ungureanu, R. (2012). The adoptive family within the Romanian cultural context: an exploratory study. *Adoption Quarterly*, 15, 1–17. doi: 10.1080/10926755.2012.661327>> ~~et al.~~, Muntean, & Ungureanu., 2012; Pace et al., 2015). However, the picture is still unclear, as most of the studies considered mixed samples composed of internationally adopted and nationally adopted adolescents, with different sample sizes and assessment of attachment patterns using different measures (Pace, 2014).

The relationship between attachment representations and behavioural problems was investigated by several studies summed up in recent meta-analyses. Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, and Roisman (2010) found a significant association ( $d = 0.31$ ) between attachment security and externalizing behaviour. Similar findings were reported in another meta-analysis (Hoeve et al., 2012) on the association between attachment pattern and delinquency that showed a small to moderate effect size ( $d = 0.36$ ). A meta-analysis (Baer & Martinez, 2006) investigating child maltreatment as the key factor leading to insecure attachment, considered eight studies ( $N = 791$ ), including children under 48 months of age, who experienced different types of maltreatment, cases of malnutrition, and failure to thrive. Results showed that the maltreated

infants were significantly more likely to have an insecure attachment than the controls (abuse,  $d = 7.5$ ; failure to thrive,  $d = 3.7$ ). A more recent meta-analysis showed a small to medium effect size in the association between the insecure attachment pattern (particularly avoidant) and internalizing behaviours in early life (Madigan, Atkinson, Laurin, & Benoit, 2013).

Despite these empirical evidences, the relationship between attachment representations and behavioural problems in adopted children and adolescents remains unclear. A study on 56 adopted children (Marcovitch et al., 1997) showed that those with a longer time of institutionalization (more than 6 months) had more behaviour problems, assessed by Child Behaviour Check List (CBCL), than those who spent less than 6 months in hospitals and orphanages, although the association between attachment patterns and behaviour problems was found to be weak. Another study (Farina, Leifer, & Chasnoff, 2004) on 24 American families who adopted Russian children showed a significant correlation between insecure attachment and child behavioural problems. Regarding children living in risk context, a study comparing 19 Portuguese institutionalized children and those living with their birth families ( $n = 72$ ) showed that the security of attachment fully mediated the relationship between institutionalization and externalizing aggressive behaviour (Torres, Maia, Veríssimo, Fernandes, & Silva, 2012).

As far as we are aware, only one study (Escobar et al., 2014) investigated attachment models and behaviour problems in adopted adolescents ( $n = 25$ ), comparing them with nonadopted ones ( $n = 25$ , aged between 11 and 18). Data showed that although the adopted adolescents presented higher levels of insecure attachment than controls but no significant differences were found between groups in terms of behavioural problems; there was a significant interaction between adoption and attachment only on the thought problems scale, with the nonadopted/insecure adolescents scoring higher than adopted ones.

In sum, overall literature review shows that the relationship between behavioural problems and attachment representations is not entirely defined among adopted adolescents, requiring further investigation, and leaving room for other variables to be taken into account.

### 1.3 Emotion regulation and behaviour problems in risk and adoption contexts

A large number of studies shows great interest in responsible mechanisms in the relationship between attachment and psychopathology and considering emotion regulation as a mediator. <<Query: AUTHOR: The citation "Kullik, & Peterman, 2013" has been changed to "Kullik & Petermann, 2013" to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: The change is fine. The correct form is "Kullik & Petermann, 2013".>> (Kullik & Petermann, 2013). Emotion regulation (ER) is a process that allows individuals to modulate their emotions consciously and unconsciously and to appropriately respond to the demands of the environment (Campbell-Sills & Barlow, 2007; Cole, Martin, & Dennis, 2004; Gross, 1998; Rottenberg & Gross, 2003; Thompson, 2015; Zimmermann & Iwanski, 2014). A model by Gross (1998, 2014), two emotion regulation strategies are reported: cognitive reappraisal and expressive suppression. *Cognitive reappraisal* is a flexible and antecedent-focused strong strategy, which involves reconsidering a stressful situation from a different perspective, producing a positive interpretation of the situation in order to decrease the distress (Gross, 1998). This strategy increases the intensity and frequency of positive emotions, decreasing negative ones, and it requires managing one's emotional response as soon as it arises, using an individual's resources (Gross & John, 2003; Gullone, Hughes, King, & Tonge, 2010). *Expressive suppression* can be understood as an attempt to hide, reduce, or inhibit emotion regulation strategies, on a verbal and non-verbal level, without reducing the subjective and physiological experience of negative emotions as this may be still ongoing and unresolved. Although expressive suppression may be effective in the short term, it will be less and less effective in reducing emotion and arousal in the long term (Gross, 1998; Gross & Thompson, 2007; John & Gross, 2004). Furthermore, in contrast to cognitive reappraisal, which promotes emotionally engagedment and appropriate behaviours, expressive suppression comes late in the emotion regulation process, requiring individuals to manage emotional responses while they occur, with consequent detrimental effects on their cognitive and social performances (Richards & Gross, 1999).

Recently, a substantial research has shown evidence of the relationships between emotion regulation strategies and the development, maintenance, and recovery from several forms of psychopathology both in adults and youths (see Aldao, Nolen-Hoeksema, & Schweizer, 2010 for a review). Regarding adolescents, a controlled study with 44 participants aged between 12 and 16 years found that high depressive symptomatology was associated with higher levels of expressive suppression and lower levels of cognitive reappraisal (Betts, Gullone, & Allen, 2009). Specific emotion regulation strategies, such as expressive suppression, were found to be linked to psychopathology, to its aetiology and maintenance (e.g., depression, anxiety, and eating disorders, Aldao & Nolen-Hoeksema, 2010). Deficit in using cognitive reappraisal in negative emotional situations was found in a controlled study on 49 children aged between 10 and 17, with a diagnosis of generalized anxiety, social anxiety, and separation anxiety disorder (Carthy, Horesh, Apter, Edge, & Gross, 2010). Another study with 177 adolescents ( $M = 13.6$  years) assessed on five indicators of ER (cognitive reappraisal, expressive suppression, concealing, emotional engagement, and adjusting) found that those reporting high scores on expressive suppression or concealing were also reporting higher level of internalizing problems (Lougheed & Hollenstein, 2012). These findings suggest that having a limited ER repertoire in adolescence may be associated with internalizing problems. Moreover, literature suggests that expressive suppression can be highly correlated with anxious and depressive symptoms, especially in presence of insecure/disorganized attachment within parent–child relationship (Brenning, Soenens, Braet, & Bosmans, 2012; Brumariu, Kerns, & Seibert, 2012).

Some studies with samples in risk contexts found impairments in emotion regulation and emotional and behavioural problems in youths (Phillips & Power, 2007). As Kim and Cicchetti (2010) reported, maltreated children with less emotion regulation skills were less accepted by their peers, as they probably showed more externalizing problems. Moreover, maltreated adolescents reported higher internalizing/externalizing symptoms, compared to their nonmaltreated peers, and this relation was often mediated by the individual's emotion regulation strategy (Alink, Cicchetti, Kim, & Rogosch, 2009).

There are only few studies that investigated ER in adoption context, providing evidence of the importance of early nurturing environment as having a remarkable impact on the brain's development and on the ER strategies themselves. A neurobiological study using magnetic resonance imaging to compare 38 previously institutionalized adopted children with a comparison group, never institutionalized ( $n = 40$ ), showed that late adoption was associated with larger amygdala volume, poor emotion regulation strategy, and increased anxiety, providing evidence that prolonged orphanage care produces changes in limbic circuit, with consequent impairment in social problems (Tottenham et al., 2010). Another study examined ER strategies in adopted sample using a pretend play task, comparing adopted children—divided in two groups based on the age at placement and length of previous institutionalization—with nonadopted and never institutionalized children ( $N = 90$ , Bátki, 2013). Findings revealed that early institutional care resulted in less developed capacities of emotion regulation, as these children are less capable of pretend play and show delay in emotion regulation abilities compared to those raised in their birth families.

To our knowledge, to date, no study has explored emotion regulation strategies—in terms of cognitive reappraisal and expressive suppression—of late-adopted adolescents and the impact of such strategies on the onset of externalizing/internalizing problems; therefore, this study aims to address this issue.

## 1.4 Current study

With respect to the theoretical background presented above, the goals of the current study were as follows: first, to compare late-adopted adolescent and their control peers with respect to attachment representations, emotion regulation strategies, and behavioural problems; second, to explore the relationship among these variables, after controlling for verbal skills. Our main hypothesis is that insecure/disorganized attachment representations and poor emotion regulation competences would positively correlate with adolescents' behaviour problems. Therefore, we would explore whether adoption/nonadoptions status of adolescents would moderate the relationship between low attachment security/low emotion regulation and behaviour problems. That is, we expected that attachment insecurity and poor emotion regulation would be positively associated with behavioural problems only among adopted youth, but not among nonadopted ones.



## 2 METHOD

### 2.1 Participants

Participants were 80 adolescents, 48.4% girls, aged 12–16 years ( $M = 13.88$ ; standard deviation [ $SD$ ] = 1.69). Two different groups were compared in this study.

The first group (adopted group [AG]) was composed of 46 late-adopted adolescents ( $M = 13.89$ ;  $SD = 1.64$ ), 23 boys and 23 girls, who have been placed between 4 and 9 years ( $M = 6.24$ ;  $SD = 1.59$ ). They have been living with their adoptive parents for at least 4 years ( $M = 7.56$ ,  $SD = 1.46$ ). Ninety-one percent were internationally adopted (50% from South America, 24% from East Europe, 14% from Asia, and 12% from Africa). Eighty-seven percent of them had lived with their family of origin, and then they were removed as a result of neglect, maltreatment, or abandonment. Before being adopted, 83% of children were placed in an institutionalized setting for a period ranging from 6 to 72 months ( $M = 31.56$ ;  $SD = 19.67$ ). No differences emerged between domestically and internationally adopted children with regard to both control variables (gender, children's verbal IQ, children's and parents' age at assessment, parental years of education, and years of marriage, all  $p$  values between .11 and .98) and adoption variables (children's age at adoption, institutionalization, length of adoptive placement, all  $p$  values between .13 and .81).

The control group (nonadopted group [NAG]) was composed of 34 Italian-speaking children who were raised by their biological parents and were recruited from secondary and high schools in Italy. The NAG was composed of 14 boys and 20 girls, matched with respect to age with the AG ( $M = 13.88$ ;  $SD = 1.78$ ).

The inclusion criteria for both groups were belonged to intact families (e.g., divorced, widowed, and single parents were excluded), adolescents without severe physical disabilities and/or psychiatric diagnosis, living in urban contexts. Despite a higher percentage of girls (58.8%) in the NAG than in the AG (50%), there were no significant differences between the two groups with respect to children's gender, as well as parental educational level and years of marriage ( $p$  values between .18 and .69).

### 2.2 Measures

#### 2.2.1 Attachment representations

Attachment representations of adolescents were assessed using the Italian version of the Friends and Family Interview (FFI, Pace & Zavattini, 2009, Italian translation authorized by Howard Steele, Steele & Steele, 2005). The FFI is a semi-structured interview, informed by but distinct from the Adult Attachment Interview (AAI; Main, Hesse, & Goldwyn, 2008), that asks young people (aged 11 to 17) a set of 27 questions about themselves and their relationships with the most significant persons in their lives, including parents, friends, siblings, and preferred teacher. The FFIs were videotaped and transcribed *verbatim*. The FFI's coding system (Steele, Steele, & Kris, 2009a) consists of nine dimensions, each with the respective subdimensions: (a) coherence based on Grice's well-known maxims of good conversation: truth, economy, relation, manner, and overall coherence; (b) reflective functioning including developmental perspective, theory of mind (mother, father, friend, sibling, and teacher), and diversity of feelings (self, mother, father, friend, sibling, and teacher); (c) evidence of secure base: mother, father, and other significant figure; (d) evidence of self-esteem including social competence, school competence, and self-regard; (e) peer relations: frequency of contact and quality of best friendship; (f) sibling relations: warmth, hostility, and rivalry; (g) anxieties and defence: idealization (self, mother, and father), role reversal (mother and father), anger (mother and father), derogation (self, mother, and father), and adaptive response; (h) differentiation of parental representations; (i) attachment patterns: secure, dismissing, preoccupied, and disorganized. The dimensions (included two non-verbal codes regarding fear/distress and frustration/anger that were not analysed in this study) are scored on a 7-point scale, from 1 to 4 (1 = *no evidence*; 2 = *mild evidence*; 3 = *moderate evidence*; 4 = *marked evidence*) including

midpoints. Finally, the FFI coding system provides a final classification—secure, dismissing, preoccupied, and disorganized—such as in the AAI coding system.

A psychometric study has confirmed that the FFI measures coherence in the same way across European countries, with the result being that it is highly correlated with attachment categories (Stievenart, Casonato, Muntean, & van de Schoot, 2012). A significant correspondence between secure–insecure adolescents' FFI and parents' AAI classifications was also revealed, confirming the FFI's construct validity (Pace et al., 2015).

For this study, two reliable raters, both trained in blind coding by Howard Steele, coded 32% of the interviews ( $n = 25$ ) and obtained Cohen's  $k = 1$  ( $p < .001$ ) on the four-way classification system, whereas the remaining FFIs were evaluated by only one of the two raters.

### 2.2.2 Emotion regulation

Adolescents' emotion regulation strategies were assessed by the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA; Gross & John, 2003; MacDermott, Gullone, Allen, Tonge, & King, 2010), an adaptation of the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003; Italian adaptation, Balzarotti, John, & Gross, 2010). The ERQ-CA is a 10-item self-report questionnaire measuring dimensions related to the ability to regulate emotions in individuals at developmental age: cognitive reappraisal—a marked strategy that implies reconsidering a stressful situation in a different perspective and producing a positive and good interpretation of it in order to decrease the distress and to increase the intensity and frequency of positive emotions, and expressive suppression—the strategy of suppressing emotional expression on a verbal and non-verbal level and experiencing less positive emotions.

In our study, the Cronbach's alpha was specifically 0.72 for cognitive reappraisal and 0.71 for expressive suppression.

### 2.2.3 Behaviour problems

Adolescents' behavioural and emotional problems were assessed through the CBCL 6–18 years version (Achenbach & Rescorla, 2001; Frigerio et al., 2004; Frigerio et al., 2009). The CBCL 6–18 is a questionnaire comprising a list of 112 items on child behaviour that needs to be rated by their parents on a 3-point Likert scale: *not true* = 0, *somewhat true* = 1, or *often true* = 2. The CBCL 6–18 identifies the following syndrome scales: anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behaviour, aggressive behaviour, and other problems. In addition, the CBCL has two groupings of syndromes, internalizing problems (grouped as follows: depressed, withdrawn/depressed, and somatic complaints) and externalizing problems (grouped: rule-breaking behaviour and aggressive behaviour), and a total score. A validation study for the Italian version of the CBCL 6–18 by d'Orlando, Grassi, and Di Blas (2010) was conducted in a sample of 466 mothers and 97 fathers of Italian children between 8 and 11 years old. The Cronbach's alpha of the syndrome scales was  $>0.64$  for internalizing problems and externalizing problems, except for rule-breaking scale ( $\alpha = 0.57$ ).

In this study, the problem behaviours were reported by the children's mothers, who completed the questionnaire alone, in the same week in which the adolescents were assessed. The Cronbach's alpha of the syndrome scales was 0.80 for internalizing problems and 0.89 for externalizing problems.

### 2.2.4 Verbal skills

To control for possible confounding effects on attachment narratives due to the differential language competence of adolescents (Pace et al., 2015; Steele & Steele, 2005), participants' verbal skills were assessed using the verbal subtests of the Wechsler Intelligence Scale for Children (verbal WISC-III; Wechsler, 1991; Italian version by Orsini & Picone, 2006). The Italian version of the whole measure was standardized on a

sample of 2,200 children (6 to 16 years) divided into 11 groups according to their age. The measure is composed of 13 subtests clustered in two subscales: verbal and performances subtests. Child's cognitive abilities are assessed according to three scores: verbal IQ, performances IQ, and total IQ, which is the result of the sum of the two former.

The verbal WISC III consists of the following subtests: information, similarities, arithmetic reasoning, vocabulary, comprehension, and memory figures. The child's verbal IQ is obtained from the sum of the weighted points of the first five verbal subtests, whereas the factor score of verbal comprehension is obtained on the basis of the weighted score received in the following subtests: similarities, vocabulary, and comprehension (Cronbach's alpha was 0.78). Tests of information and word reasoning are optional.

### **2.2.5 Family data and adoption background**

An ad hoc socio-demographic questionnaire was developed to collect both family data, such as parents' age of birth, education level, and year of marriage, and information concerning the details of adoption, such as children's age on arrival, country of origin, length of adoption, and preadoption information. All such information was provided by the mothers.

### **2.2.6 Procedure**

The adoptive families were recruited through two authorized international adoption agencies, an association supporting adoptive families and the social health service specialized in adoption work. Among all the adoptive families we contacted, six of them did not participate in our study for the following reasons: One adopted adolescent was excluded because he or she received a diagnosis of a severe metabolic disease (he or she was not able to speak); two families never responded to any attempts to contact them by telephone, email, and mail; two families refused due to lack of time; and one family refused because the adoptive mother was undergoing chemotherapy. Nonadoptive families were recruited from a middle and high school. Due to inclusion criteria, two adolescents of the NAG were excluded because they did not belong to intact families (they lived with their divorced mothers).

All the participants came from urban areas of central Italy (Rome, L'Aquila, and Teramo).

The research project had the prior approval of the University of Rome "Sapienza" Ethics Committee. All the families were informed of the research goals by the university staff. In line with ethical requirements, it was emphasized that participants' cooperation was voluntary and that their answers were confidential and used only for the purpose of the study. Parents who agreed to their children's participation in the study signed a voluntary consent form in accordance with the Declaration of Helsinki.

The AG data were collected during a session lasting approximately 1.5 hr at the university's laboratory, while those of NAG were collected in an empty classroom in the schools. Mothers and children were assessed separately. The FFI, the WISC-III, and the ERQ-CA were administered to the adolescents, whereas the socio-demographic questionnaire and the CBCL were completed by their mothers as part of a larger study, which included other maternal measures such as the AAI (Pace et al., 2015). Data were collected over a 1-year period (2014).

### **2.2.7 Statistical plan**

Statistical analyses were conducted using the Statistical Package for Social Science (Version 21.0) software.

First, we presented descriptive statistics and group comparisons on study and control variables for the AG and the NAG. Next, the relationship between adoption, attachment representations, emotion regulation, and behaviour problems was analysed through correlation/moderation analysis, consisting of two steps: (a) main

effects model or bivariate correlations between the variables in study separate for the AG and the NAG and (b) moderation analysis of indirect effects. An analysis was considered statistically significant if  $p \leq .05$ .

### 3 RESULTS

#### 3.1 Descriptive results and group comparisons

Two of the FFIs from the NAG (both females) were excluded because of technical problems in the video recording.

The FFI secure–insecure classifications, emotion regulation strategies, and behaviour problems proved to be independent of adolescents' gender and age, parental educational level, and adoption variables (e.g., adolescents' age at adoption, domestic/international adoption, and country of origin,  $p$  values between .10 and .98).

Regarding the FFI's attachment classifications, the distribution of the AG was 65.2% secure ( $n = 30$ ), 28.3% dismissing ( $n = 13$ ), and 6.5% preoccupied ( $n = 3$ ), whereas the distribution of the NAG was 75% secure ( $n = 24$ ), 21.9% dismissing ( $n = 7$ ), and 3.1% preoccupied ( $n = 1$ ). None of participants was classified as disorganized. The groups did not differ in their attachment classifications either in the three-way  $\chi^2 = 0.99$ ,  $df = 2$ ,  $p = 0.61$ , *n.s.*) has been changed to ( $\chi^2 = 0.99$ ,  $df = 2$ ,  $p = 0.61$ , *n.s.*). Please check. Ans: The change is fine >> ( $\chi^2 = 0.99$ ,  $df = 2$ ,  $p = .61$ , *n.s.*) or the secure-insecure systems ( $\chi^2 = 0.85$ ,  $p = .36$ , *n.s.*).

Table 1 presents both descriptive statistics and group comparisons of the study and control variables, such as attachment patterns on continuous scales, emotion regulation strategies, behaviour problems, and verbal skills.

**Table 1** Descriptive statistics and group comparisons of the study and control variables

	AG	NAG	<i>t</i>	<i>p</i>
	Mean ( <i>SD</i> )	Mean ( <i>SD</i> )		
Verbal skills	96.33 (25.18)	105.36 (18.02)	-1.76	.08
Attachment patterns (FFI)				
Secure	2.66 (.83)	2.88 (.74)	-1.16	.25
Dismissing	2.10 (.90)	1.88 (.81)	1.12	.27
Preoccupied	1.50 (.76)	1.33 (.58)	1.08	.28
Disorganized	1.21 (.48)	1.13 (.31)	0.85	.40
Emotion regulation (ERQ-CA)				
Cognitive reappraisal	2.40 (.70)	2.54 (.86)	-0.78	.44
Expressive suppression	1.95 (.93)	1.49 (.77)	2.38	.02*
Behaviour problems (CBCL)				
Anxious/depressed	4.76 (3.50)	3.76 (3.17)	1.19	.24

	AG		NAG		<i>t</i>	<i>p</i>		
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)				
Withdrawn/depressed		3.72 (3.69)	2.12 (2.37)		1.96	.06		
Somatic complaints		.83 (1.57)	1.88 (1.81)		-2.56	.01**		
Social problem		2.74 (3.00)	2.16 (2.76)		0.80	.43		
Thought problems		1.43 (1.87)	2.00 (3.58)		-0.88	.38		
Attention problems		5.72 (4.10)	3.12 (2.60)		2.87	.01**		
Rule-breaking behaviour		2.72 (2.71)	1.12 (1.59)		2.70	.01**		
Aggressive behaviour problems	6.46 (5.22)	3.92 (3.38)	2.19	.03*Other	2.22 (2.58)	2.44 (2.49)	-0.35	.73
Total internalizing		9.30 (6.66)	7.76 (6.16)		0.96	.34		
Total externalizing		9.17 (7.43)	5.04 (4.62)		2.53	.01**		
Total problems		33.39 (21.01)	22.52 (18.15)		2.18	.03*		

*Note.* AG = adopted group; NAG = nonadopted group; FFI = Friends and Family Interview; ERQ-CA = Emotion Regulation Questionnaire for Children and Adolescents; CBCL = Child Behaviour Check List.

\*\* Correlation is significant at the .01 level (2-tailed).

\* Correlation is significant at the .05 level (2-tailed).

As Table 1 shows, the AG and NAG did not differ in their attachment patterns scored on continuous scale of the FFI. Regarding the ERQ-CA, the adopted adolescents presenting higher scoring than nonadopted ones in expressive suppression. Regarding the CBCL, the AG were scored significantly higher than NAG in attention problems, rule-breaking behaviour, aggressive behaviour, externalizing problems, and total behaviour problems, whereas controls received significantly higher scoring on somatic complaints than the AG.

### 3.2 Correlations among attachment, emotion regulation, and behaviour problems in adopted and nonadopted adolescents

For the following analyses, we decided to use the global scores of the CBCL—internalizing, externalizing, and total behaviour problems—for a more succinct presentation of the results. As Table 2 shows, in the AG higher scores on secure and lower scores on disorganized attachment (on continuous scale) were significantly correlated with lower internalizing problems, higher scores on cognitive reappraisal were significantly correlated with lower externalizing and total behaviour problem, verbal skills were positively correlated with attachment security and negatively with disorganization and internalizing problems. Surprisingly, in the NAG, we found significant and positive correlation between verbal skills and externalizing and total behaviour problems.



**Table 2** Correlations of the study and control variables in the adopted group (AG) and nonadopted group (NAG)

		Attachment patterns				Emotion regulation		Behaviour problems	
		Secure	Dismissing	Preoccupied	Disorganized	Cognitive reappraisal	Expressive suppression	Internalizing	Externalizing
AG	Verbal skills	.66**	-.43**	-0.16	-.34*	-0.11	-0.18	-.37*	-0.14
	Secure		-.59**	-0.17	-.49**	-0.02	-0.11	-.32*	-0.08
	Dismissing			-.48**	0.13	0.04	-0.12	0.27	-0.19
	Preoccupied				.41**	-0.06	0.18	0.05	0.22
	Disorganized					0.07	0.26	.30*	0.06
	Cognitive reappraisal						.49**	-0.01	-.49**
	Expressive suppression							0.12	-0.12
	Internalizing								.43**
	Externalizing								
NAG	Verbal skills	.43*	-0.24	0.01	0.25	0.03	0.13	0.23	.47*
	Secure		-.64**	-0.07	0	0.01	-0.03	0.02	0.107
	Dismissing			-.50**	-0.03	0.12	0.24	-0.11	-0.21
	Preoccupied				0.03	-0.26	-0.09	0.38	0.31
	Disorganized					-0.21	0.26	0.37	0.22
	Cognitive reappraisal						-0.04	-0.39	-0.34
	Expressive suppression							0.08	0.10
	Internalizing								.62**
	Externalizing								

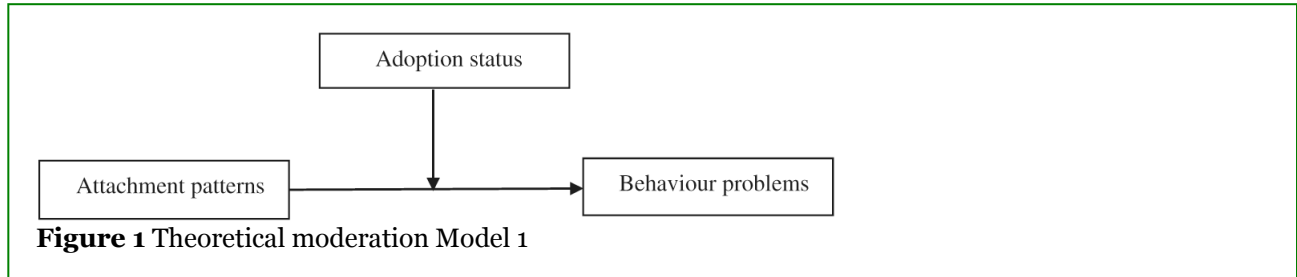
\*\* Correlation is significant at the .01 level (2-tailed).

\* Correlation is significant at the .05 level (2-tailed).

### 3.3 Moderation models

To examine our predictions, we conducted moderation analyses, by using Hayes's (2012) PROCESS macro (Model 1).

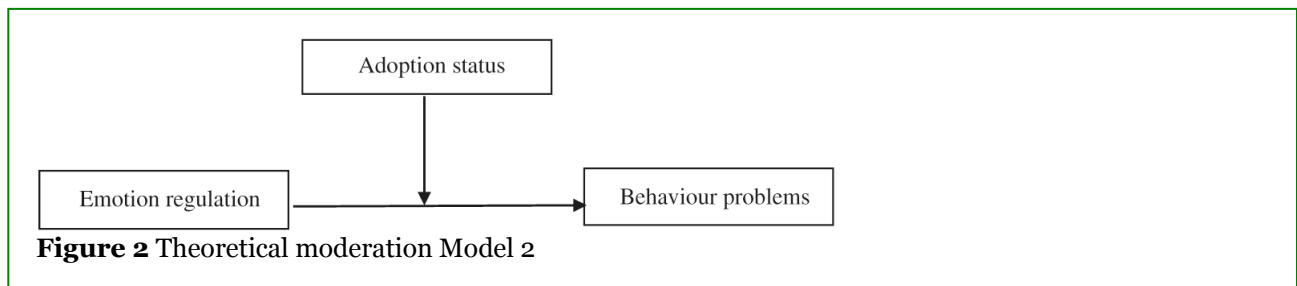
The first conceptual framework of the proposed model is shown in Figure 1. In this model, attachment patterns (secure, dismissing, preoccupied, and disorganized scored on continuous scale) were entered as the independent variables, behaviour problems (internalizing, externalizing, and total problems) as the dependent variables, and adoption status (0 = NAG; 1 = AG) as the moderator. Moreover, we added verbal skills as covariate.



Moderation analyses did not reveal any predictive effect of secure, dismissing and preoccupied attachment, adoption status, their interaction, or verbal IQ on internalizing problems; only disorganized pattern positively predicted internalizing problems ( $b = 4.72, SE = 1.82, t [4, 65] = 2.60, p = .012, 95\% CI [1.092, 8.350]$ ).

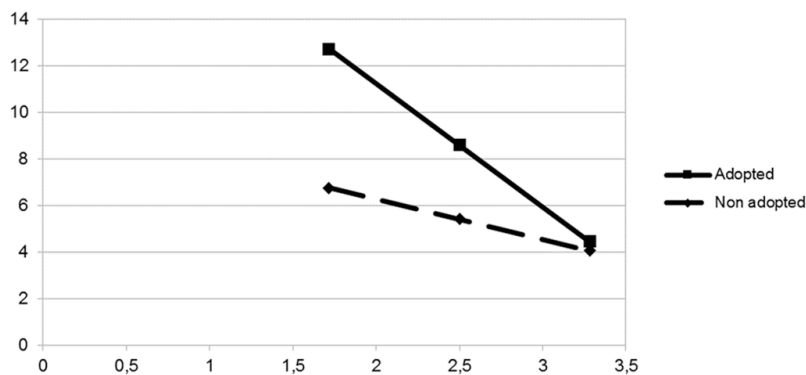
Further, all attachment patterns, their interaction with adoption status, and verbal IQ predicted neither externalizing nor total behaviour problems, whereas only adoption status predicted positively externalizing problems and (sometimes) total behaviour problems, confirming previous analyses about group comparisons.<sup>2</sup>

The second conceptual framework of the proposed model is shown in Figure 2. In this model, emotion regulation strategies (cognitive reappraisal and expressive suppression) were entered as the independent variables, behaviour problems (internalizing, externalizing, and total problems) as the dependent variables, and adoption status (0 = NAG; 1 = AG) as the moderator. Again, we considered verbal skills as covariate.



No predictive effects of cognitive reappraisal, adoption status, their interaction, and verbal IQ on internalizing problems were emerged.

Moderation analyses found that cognitive reappraisal negatively predicted externalizing problems ( $b = -4.07, SE = 0.96, t [4, 65] = -4.22, p = .000, 95\% CI [-5.999, -2.146]$ ), whereas adoption status positively predicted externalizing problems ( $b = 3.18, SE = 1.57, t [4, 65] = 2.03, p = .047, 95\% CI [.046, 6.323]$ ). Crucially, the interaction cognitive reappraisal x adoption status was (marginally) significant ( $b = -3.57, SE = 1.88, t(4, 65) = -1.90, p = .062, 95\% CI [-7.313, 0.180]$ ). The simple slope analysis revealed that in the AG cognitive reappraisal was negatively associated with externalizing problems ( $b = -5.30, SE = 1.28, t [4, 65] = -4.13, p = .000, 95\% CI [-7.856, -2.734]$ ), whereas the relationship between these variables in the NAG was not significant ( $b = -1.728, SE = -1.370, t [4, 65] = -1.26, p = .212, 95\% CI [-4.464, 1.007]$ ) as shown in Figure 3.



**Figure 3** Interactive effects of cognitive reappraisal and participants' adoption status on externalizing problems

Data showed that only cognitive reappraisal negatively predicted total behaviour problems ( $b = -9.61$ ,  $SE = 3.10$ ,  $t [4, 65] = -3.10$ ,  $p = .003$ , 95% CI  $[-15.809, -3.408]$ ), although they were not predicted neither by adoption status, its interaction with cognitive reappraisal and verbal skills.

Finally, we found that neither expressive suppression, adoption status, their interaction, and verbal skills did not predict neither internalizing problems nor total behaviour problems, whereas only adoption status predicted externalizing problems ( $b = 4.07$ ,  $SE = 1.84$ ,  $t [4, 65] = 2.22$ ,  $p = .030$ , 95% CI  $[.406, 7.737]$ ), confirming previous results about group comparisons.

## 4 DISCUSSION AND CONCLUSION

This study investigated attachment representations, emotion regulation strategies, and behavioural problems of adopted and nonadopted adolescents.

Regarding the group comparison, first, our data did not reveal significant differences with respect to FFI attachment classifications between the late-adopted and nonadopted adolescents. This result did not confirm the results of the only other previous study **with a non-adopted control group**, that found that adopted adolescents showed a more insecure attachment, specifically a predominantly insecure-dismissing one (Escobar & Santelices, 2013). Otherwise, we found 65% of adoptees classified as secure, in line with literature using the FFI with adopted samples (see Pace, 2014 for a review). Although these positive findings can be difficult to be explained, taken together, they may suggest that adoption services in Italy could effectively prepare adoptive parents for the challenges of the adoption process and support them after placement, fostering parental commitment in their children's development that might indirectly turn into higher security of attachment also in late-adopted adolescents. Second, this study showed that adopted adolescents, compared to nonadopted ones, reported higher level of expressive suppression strategies, which may be considered as an attempt to be compliant with the environment's requests in order to be loved, accepted, and nurtured. Such strategy, developed over time, can be detrimental for optimal long-term emotion regulation. In other words, we may suggest that adolescent adoptees would be "obliged" to acquire and use expressive suppression, which is a conscious strategy to downplay or suppress negative emotions and to manage emotional responses (Richards & Gross, 1999). Recurring use of this strategy might lead to development of a disengaged/withdrawn behaviour due to a discrepancy between inner and outer experiences, with remarkable consequences in terms of social impairments. This also reflects an automatic strategy to conform to one's social environment in order to gain approval and to preserve relationships. Third, the AG scored higher than NAG for attention problems, rule-breaking **and aggressive** behaviour, externalizing, and total behaviour problems, in line with previous meta-analyses and reviews reporting an increased risk of externalizing problems, especially for older adopted children in adolescence, but with a modest effect sizes (Bimmel et al., 2003; Hawk & McCall, 2010; Juffer & van IJzendoorn, 2005; Palacios & Brodzinsky, 2010).

These findings also suggest that late-adopted adolescents may struggle more than their nonadopted peers with issues related to their individual, cultural, and racial identity, often acting out their anger and frustration in an attempt to seek attention and care. Moreover, the NAG reported higher scores than AG on somatic complaints. Somatization is the propensity to experience psychological symptoms and/or emotional disease through physical symptoms that cannot be explained by medical causes. Somatic complaints in adolescence may be a result of an inability to verbalize emotional distress (Gupta Karkhanis & Winsler, 2016). In nonadopted adolescents, this impairment might impede mentalizing of experienced emotions in an attempt to gain love, care, and attention from the other. Adopted adolescents, however, might struggle to experience their body and its weaknesses in the form of physical disease, as a self-defence mechanism and adaptive strategy in order to overcome early affective experiences of severe deprivation. The citation “Hoksbergen, Rijk, Dijkum, & Laak, 2004” has been changed to “Hoksbergen, Rijk, Van Dijkum, & Ter Laak, 2004” to match the author name/date in the reference list. Please check if the change is fine in this occurrence and modify the subsequent occurrences, if necessary. Ans: The change is not fine. The correct form is “Hoksbergen, Rijk, Van Dijkum, & Ter Laak, 2004”. In the reference list, you can also add the DOI: 0196-206X/00/2503-0175>> (Hoksbergen, Rijk, Van Dijkum, & Ter Laak, 2004; Stams, Juffer, & van IJzendoorn, 2002). We would suggest that adopted adolescents have learned to appear less vulnerable, stronger, and more autonomous in the absence of caregivers, which they behave as if complaining would be useless, because they have developed an internal representation of the (primary) caregiver as an inconsistent and often unavailable figure.

Regarding separate correlations for the AG and the NAG, our results showed that only among the adoptees higher scores on attachment security and lower on disorganization were significantly correlated with lower internalizing problems. As previous literature showed, this finding can be understood as the indirect and successful consequence of attachment relationships in adoptive families in providing the opportunity for adopted children to “earn security” by offering nurturing experiences, which may mitigate the impact of adverse early environment and the onset of behaviour problems. Furthermore, our results showed that only in the AG, higher scores on cognitive reappraisal were significantly correlated with lower externalizing and total behaviour problems. Lastly, we found that in the AG verbal skills were positively correlated with attachment security and negatively with disorganization, as assessed on a continuous scale, and internalizing problems, confirming previous research on associations between cognitive abilities and attachment at developmental stage (Pace et al., 2015; Stievenart, Roskam, Meunier, & van de Moortele, 2010; Van IJzendoorn, Dijkstra, & Bus, 1995). Surprisingly, in the NAG, verbal skills were found to be positively correlated with externalizing and total behaviour problems, suggesting that advanced linguistic skills go along with expressive behaviour and actions. Although, this unexpected result deserves further investigation, in the current study, verbal skills were entered as covariate in the moderation models due to the nature of these correlations.

Regarding moderation analyses, results from the first conceptual model showed that none of the attachment patterns, scored on continuous scales, were predictors of externalizing and total behaviour problems but that the latter were predicted only by the adoption status. This finding limited the importance of the attachment status itself in accounting for the onset of behavioural problems, suggesting that the externalizing symptomatology more likely occurs in adopted adolescents rather than in their peers brought up in biological families, even if they showed secure attachments. Further research is needed on intervening factors leading to maladaptive behaviour in adopted adolescents. In this study, only disorganized pattern, scored on continuous scale, positively predicted internalizing problems, without any interaction with adoption status. Such result suggests that attachment disorganization, even when identified by minor markers of incoherence in the narrative, rather than a pervasive and overall classification, may represent a universal risk factor for the development of internalizing problems, independently of being brought up in an adoptive or a birth family (Madigan et al., 2013). Results from the second conceptual model of moderation analyses showed that cognitive reappraisal negatively predicted externalizing problems, whereas adoption status positively predicted them, and that there is a marginal effect of the interaction cognitive reappraisal x adoption status. Specifically, in the AG, cognitive reappraisal was negatively associated with externalizing problems, although this relation was not revealed in the NAG. This finding suggests that for late-adopted adolescents, more than their nonadopted peers, the ability to restructure negative situations, turning it into a different positive perspective—by increasing the intensity and frequency of positive emotions while decreasing the negative ones—can be a protective factor in reducing the onset of externalizing problems (Gross & John, 2003; Gullone et al., 2010). This antecedent-focused strategy, preceding the emotional response before this is generated,

may lead to socially appropriate behaviour. Thus, reinforcing the use of this strategy could be a useful preventive intervention for adopted adolescents. Either biological or adoptive adolescence is a time for flexible integration, when positive or negative experiences, due to increased metacognitive skills, are coherently integrated and reassessed. Morris, Silk, Steinberg, Myers, and Robinson (2007) assumed that emotional regulation skills are learnt within the family context. Through the observation of mutual emotional expression and interactions, parents attempt to help children name and verbalize emotions (Thompson, 2015). In this light, we suggest that both adoptive parents and adopted adolescents can benefit in learning or strengthening their cognitive reappraisal strategies to decrease the distress, reframing a stressful situation in a different and positive perspective.

Despite the clinical relevance of these findings, we should address some limitations. First, emotion regulation was assessed by administering a self-report, which may be affected by a social desirability bias. Future studies should include the assessment of physiological measures in combination with self-report in order to have a more reliable evaluation of this construct or at least an index of the discrepancy from what someone experiences on an implicit level and what she or he is able to report as conscious experience. Second, the sample considered in this study was composed of an unbalanced number of adopted participants, from domestic and international adoption, respectively; thus, apart from a qualitative perspective, it was not possible to investigate characteristics of specific subgroups (for example, those institutionalized vs. noninstitutionalized). Third, small size of the control group reduced the generalizability of our results. Last, this study was designed as a cross-sectional study, thus any direction of causality cannot be assumed. Further longitudinal research on adoption, assessing children's and parents' attachment from the placement onward, is needed.

Overall, findings from this study point to the importance of working on adoptees' emotion regulation strategies before adoptees enter adolescence, in order to increase cognitive reappraisal and to decrease the level of emotion suppression. Our findings also underscore the role of policymakers, therapists, and social services supporting adoptive parents in understanding. Achieving adaptive strategies of emotion regulation may be a challenging task for their children, as they are partially set from early experiences. However, emotion regulation strategies can be reframed within the relationships built up in the new family environment, as a change in the developmental path is always possible, especially due to the plasticity of adolescence.

## ACKNOWLEDGEMENTS

The authors would like to thank all the participants of the study for telling us about their lives, a task that was sometimes hard to complete. They are also grateful both to the adoption social workers and the scholastic institutions that helped in the recruitment of participants and to the students for contributing to the data collection. Lastly, the authors would like to thank both Prof. Giulio Cesare Zavattini, for his theoretical and clinical supervision, and Prof. Luca Andrighetto, for his methodological considerations.

## ENDNOTES

<sup>1</sup>Total behaviour problems  $d = 0.18$  for total sample, 0.11 for international, and 0.20 for domestic adoption; externalizing behaviour problems  $d = 0.24$  for total sample, 0.10 for international, and 0.34 for domestic adoption; internalizing behaviour problems  $d = 0.16$  for total sample, 0.07 for international, and 0.23 for domestic adoption.

<sup>2</sup>Specifically, (a) considering secure attachment as independent variable, the adoption status predicted positively both externalizing ( $b = 4.30$ ,  $SE = 1.76$ ,  $t [4, 65] = 2.45$ ,  $p = .017$ , 95% CI [.789, 7.804]) and total behaviour problems ( $b = 11.06$ ,  $SE = 5.28$ ,  $t [4, 65] = 2.10$ ,  $p = .040$ , 95% CI [.520, 21.594]); (b) considering dismissing attachment as independent variable, the adoption status predicted positively both externalizing ( $b = 4.31$ ,  $SE = 1.72$ ,  $t [4, 65] = 2.50$ ,  $p = .015$ , 95% CI [.868, 7.756]) and total behaviour problems ( $b = 11.07$ ,  $SE = 5.32$ ,  $t [4, 65] = 2.08$ ,  $p = .042$ , 95% CI [.441, 21.707]); (c) considering preoccupied attachment as independent variable, the adoption status predicted positively externalizing problems ( $b = 4.01$ ,  $SE = 1.71$ ,  $t [4,$



65] = 2.35,  $p = .022$ , 95% CI [.599, 7.417]); (d) considering disorganized attachment as independent variable, the adoption status predicted positively externalizing problems ( $b = 4.02$ ,  $SE = 1.76$ ,  $t [4, 65] = 2.29$ ,  $p = .025$ , 95% CI [.515, 7.530]).

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