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Effect of a parenting intervention on decreasing adolescents' behavioral problems via reduction in attachment insecurity: A longitudinal, multicenter, randomized controlled trial

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ABSTRACT

Introduction: Secure attachment in adolescence, related to caregiving quality, is a robust predictor of positive behavioral adjustment in early adulthood and beyond. Nevertheless, few attempts have been made to develop treatments to promote parent–adolescent attachment security.

Methods: Using a longitudinal, multicenter, randomized controlled trial design, two questionnaire-based studies were run in Italy (Study 1: $n = 100$ mothers of adolescents, 60% boys, $M_{age} = 14.89$, $SD = 1.58$; Study 2: $n = 40$ mothers and 40 adolescents, 60% boys, $M_{age} = 14.90$, $SD = 1.91$) to test the effectiveness of an attachment-based parenting intervention (i.e., Connect) in reducing adolescents' behavioral problems and attachment insecurity 2 weeks post-intervention (t2) and at a 4-month follow-up (t3). It was further investigated whether a decrease in avoidant and anxious attachment at t2 would account for changes in externalizing and internalizing problems, respectively, at t3. All adolescents belonged to two-parent intact families.

Results: Mothers who completed Connect reported significantly fewer adolescent behavioral problems and lower adolescent attachment insecurity, compared to mothers in the waitlist group, at both t2 and t3 (Study 1). These findings were confirmed in a second subsample (Study 2), considering both mothers' and adolescents' reports. Controlling for pre-intervention behavioral problems, reductions in internalizing and externalizing problems were observed in both studies at t3 via a decrease in anxious and avoidant attachment, respectively, at t2.

Conclusions: The findings point to the malleability of attachment security in adolescence and highlight the importance of targeting parenting quality to promote adolescent behavioral adjustment.

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1. Introduction

Adolescence is a time when vulnerabilities to many adult mental health issues emerge (Hofstra et al., 2000, 2002; Jones, 2013). However, rapid neurological, cognitive, and social-relational changes during this period offer immense opportunities for growth and adaptation (Kroger et al., 2010; Sercombe, 2014). In particular, social learning develops rapidly between the ages of 12 and 16, whereby structural changes in the “social brain network” sensitize adolescents to engage with and attend to others in new ways, corresponding to a rise in social understanding (Crone & Dahl, 2012; Wölfer et al., 2012). In short, the adolescent brain could not be more perfectly designed to ensure maximal fit with ever-changing social contexts (Crone & Dahl, 2012).

Attachment theory provides a comprehensive framework for understanding adolescents’ mental health in the context of the parent–child relationship (Allen & Tan, 2016; Bowlby, 1969; Brumariu & Kerns, 2010; Groh et al., 2017; Kerns & Brumariu, 2014). Adolescents, in fact, fare much better when they can rely on their parents for the provision of a safe haven and secure base (Kobak et al., 2007; McElhane et al., 2009) as they explore social roles outside the family and develop attachment relationships with peers and romantic partners (Allen & Tan, 2016). Conflict in the parent–adolescent relationship is also normative, but the ways in which the dyad negotiates this conflict and sustains the relationship have critical implications for the adolescent’s healthy development (Branje, 2018; Moretti & Holland, 2003). Adolescents who feel their relationship with their parents is secure, despite conflict, confidently move forward toward early adulthood (Allen & Tan, 2016). These securely attached adolescents do not avoid conflict, exploration, or individuation, nor do they prematurely push to independence without their parents’ support (Feeney & Cassidy, 2003; Moretti & Holland, 2003).

Secure attachment and emotional connectedness with parents, however, may be difficult to maintain. Adolescents sometimes express their needs in ways that confuse their parents; parents, in turn, may respond using strategies that are no longer effective now that their child is older (Moretti et al., 2018). As adolescents push for autonomy, parents may experience caregiving as increasingly difficult (Spring et al., 2002). As a result, they may become stressed and try to control their adolescent child using coercive and aggressive strategies, and this may damage the parent–adolescent relationship and intensify any social-emotional and behavioral difficulties that the adolescent may have. Alternatively, parents may experience their adolescent’s push for autonomy as deeply rejecting, and consequently pull away from their child (Moretti et al., 2018).

How can parents be helped in supporting their offspring through this challenging developmental transition? Although most attachment-based parenting interventions have been developed for mothers of infants or young children (Bakermans-Kranenburg et al., 2003), there has recently been increased interest in attachment-based parenting interventions for parents of adolescents (Kobak & Kerig, 2015). There are two main reasons for this: first, attachment security has been shown to be a robust predictor of adolescent positive adjustment in early adulthood and beyond (Allen & Tan, 2016; Bowlby, 1969); and second, adolescent attachment has been found to be relatively fluid and meaningfully related to changes in the quality of caregiving, even among adolescents who were insecurely attached to their parents in infancy (Beijersbergen et al., 2012; Booth-LaForce et al., 2014).

In contrast to attachment-based interventions for parents of young children, which aim at changing parents’ internal working models and increasing parental sensitivity to children’s attachment needs (Bakermans-Kranenburg et al., 2003), attachment-based parenting interventions for parents of adolescents emphasize adolescents’ active role in maintaining the attachment bond as a goal-corrected partnership (Allen & Tan, 2016). Some attachment-based interventions for adolescents already exist. For instance, the attachment-based family therapy (ABFT; Diamond, 2014) has been found to be effective in strengthening family cohesion and thereby buffering against adolescents’ suicidal thinking, depression, and risk behaviors (Diamond, 2014); furthermore, the Adolescent Mentalization-Based Integrative Treatment (AMBIT; Bevington et al., 2015) has been shown to support caseworkers in forming a relationship with difficult-to-reach adolescents through the cultivation of mentalization (Bevington et al., 2015). Notwithstanding these developments, Kobak and Kerig (2015) recently called attention to the need to provide parents of adolescents with an alternative and positive model of attachment that might alter their interpretations of and responses to their adolescent child’s problematic behaviors.

Based on these premises, Moretti et al. (2009) developed Connect—a 10-week manualized parenting program for parents or alternative caregivers of pre-adolescents and adolescents with behavioral problems. In contrast to other attachment-based interventions, which mainly target a single aspect of parenting, Connect addresses four aspects of parenting linked with attachment security in adolescence (i.e., caregiver sensitivity, reflective functioning, dyadic affect regulation, shared partnership/mutuality) to support adolescents in taking developmentally appropriate steps toward autonomy while remaining emotionally connected to their parents (Moretti et al., 2018).

Compared to social learning theory–based behavioral programs for parents of younger children (e.g., Comet, Incredible Years), Connect has been found to be particularly effective in reducing child externalizing behaviors, both post-intervention and at a 2-year follow-up (Högström et al., 2017). Furthermore, previous research from different countries (i.e., Canada, Italy, Sweden) has shown significant improvements post-intervention corresponding to medium-to-large effect sizes in a number of domains for adolescents with pre-intervention levels of externalizing symptoms in clinical and sub-clinical ranges, as reported by parents; these results have been consistent, irrespective of adolescent gender (Moretti et al., 2015, 2018). Upon completing Connect, parents have reported reduced adolescent oppositional, aggressive, and antisocial behavior (Barone et al., 2020; Osman et al., 2017a; Ozturk et al., 2019), as well as reduced anxiety and depression, compared to a waitlist group (Barone et al., 2020; Moretti & Obsuth, 2009; Osman et al., 2017b); increased parenting satisfaction and efficacy (Moretti & Obsuth, 2009; Osman et al., 2017b); decreased parenting stress (Ozturk et al., 2019); decreased adolescent overuse of wine and beer (Giannotta et al., 2013); and a shift in parenting representations toward greater mutuality, positivity, and security (Moretti et al., 2012).

In addition to offering these promising results, Connect also lays the groundwork for research into the relationship between

Table 1
Sociodemographic information and psychological variables pre-intervention by group and center in study 1 and study 2.

Study 1 (N = 100)											
	Connect group	Control group	Group effect			Center 1 (n	Center 2 (n	Center 3 (n	Center effect		
	(n = 50)	(n = 50)				= 39)	= 35)	= 26)			
	n (%)	n (%)	χ^2 (df)	p		n (%)	n (%)	n (%)	χ^2 (df)	p	
Adolescent gender			0.17 (1)	.683					4.04 (2)	.133	
Male	31 (62)	29 (58)				19 (48.7)	22 (62.9)	19 (73.1)			
Female	19 (38)	21 (42)				20 (51.3)	13 (37.1)	7 (26.9)			
Mother educational level			2.82 (2)	.244					3.98 (4)	.494	
High school or less	24 (48)	32 (64)				20 (51.3)	19 (54.3)	17 (65.4)			
Master's degree	17 (34)	13 (26)				12 (30.8)	13 (37.1)	5 (19.2)			
Post-lauream	9 (18)	5 (10)				7 (17.9)	3 (8.6)	4 (15.4)			
Mother working status			0.09 (1)	.766					0.90 (2)	.639	
Employed	43	44				33	30	24			
Unemployed ^a	7	6				6	5	2			
Mother income (in €)			1.49 (2)	.475					4.75 (4)	.314	
0–25,000	11 (22)	13 (26)				10 (25.6)	9 (25.7)	5 (19.2)			
25,001–50,000	12 (24)	16 (32)				7 (18.0)	10 (28.6)	11 (42.3)			
50,001 or higher	27 (54)	19 (38)				22 (56.4)	16 (45.7)	10 (38.5)			
Mother nationality			0.10 (1)	.749					0.83 (2)	.661	
Italian	45 (90)	44 (88)				36 (92.3)	29 (82.9)	23 (88.5)			
Non-Italian ^b	5 (10)	6 (12)				3 (7.7)	6 (17.1)	3 (11.5)			
Psychological support ^c			2.03 (1)	.155					4.42 (2)	.109	
Yes	33 (66)	26 (52)				18 (46.2)	24 (68.6)	17 (65.4)			
No	17 (34)	24 (48)				21 (53.8)	11 (31.4)	9 (34.6)			
Adolescent age	M (SD) 14.90 (1.30)	M (SD) 14.88 (1.84)	F <0.01	p .995	d .050	M (SD) 15.00 (1.52)	M (SD) 14.91 (1.62)	M (SD) 14.69 (1.67)	F 0.30	p .744	d .096
Mother age	50.52 (5.42)	48.84 (4.97)	2.61	.109	.360	49.37 (4.93)	51.26 (5.87)	48.00 (4.27)	2.70	.072	.523
Number of children	1.98 (0.89)	2.14 (0.81)	0.88	.350	.154	2.10 (0.94)	2.09 (0.74)	1.96 (0.87)	0.24	.791	.086
Attachment avoidance-m	3.71 (1.42)	3.30 (1.32)	2.22	.139	.315	3.61 (1.41)	3.43 (1.42)	3.45 (1.31)	0.20	.822	.080
Attachment anxiety-m	3.29 (1.24)	2.86 (1.26)	3.25	.074	.431	2.89 (1.23)	3.23 (1.14)	3.16 (1.27)	0.81	.448	.185
Internalizing problems-m	6.66 (4.23)	6.80 (4.18)	0.03	.868	.053	5.79 (3.97)	7.26 (4.06)	7.42 (4.55)	1.63	.201	.337
Externalizing problems-m	9.08 (4.62)	8.28 (5.21)	0.66	.419	.127	7.72 (4.98)	8.77 (4.76)	10.00 (4.88)	1.72	.185	.353
Study 2 (N = 40)											
	Connect group	Control group	Group effect			Center 1 (n	Center 2 (n	Center 3 (n	Center effect		
	(n = 20)	(n = 20)				= 17)	= 13)	= 10)			
	n (%)	n (%)	Fisher exact test, p			n (%)	n (%)	n (%)	Fisher exact test, p		
Adolescent gender			1.000						.426		
Male	12 (60)	12 (60)				8 (47.1)	9 (69.2)	7 (70)			
Female	8 (40)	8 (40)				9 (52.9)	4 (30.8)	3 (30)			
Mother educational level			.841						.531		
High school or less	8 (40)	10 (50)				6 (35.3)	6 (46.2)	6 (60)			
Master's degree	8 (40)	7 (35)				6 (35.3)	6 (46.2)	3 (30)			
Post-lauream	4 (20)	3 (15)				5 (29.4)	1 (7.7)	1 (10)			
Mother working status			.407						.374		
Employed	15 (75)	18 (90)				15 (88.2)	9 (69.2)	9 (90)			
Unemployed	5 (25)	2 (10)				2 (11.8)	4 (30.8)	1 (10)			
Mother income (in €)			.154						.332		
0–25,000	2 (10)	6 (30)				2 (11.8)	2 (15.4)	4 (40)			
25,001–50,000	2 (10)	4 (20)				3 (17.6)	1 (7.7)	2 (20)			
50,001 or higher	16 (80)	10 (50)				12 (70.6)	10 (76.9)	4 (40)			
Mother nationality			.422						.199		
Italian	18 (90)	16 (80)				16 (94.1)	9 (69.2)	9 (90)			

(continued on next page)

Table 1 (continued)

Study 2 (N = 40)										
	Connect group (n = 20)	Control group (n = 20)	Group effect			Center 1 (n = 17)	Center 2 (n = 13)	Center 3 (n = 10)	Center effect	
	n (%)	n (%)	Fisher exact test, p			n (%)	n (%)	n (%)	Fisher exact test, p	
Non-Italian	2 (10)	4 (20)	.343			1 (5.9)	4 (30.8)	1 (10)	.392	
Psychological support										
Yes	12 (60)	8 (40)				5 (29.4)	3 (23.1)	5 (50)		
No	8 (40)	12 (60)				12 (70.6)	10 (76.9)	5 (50)		
	M (SD)	M (SD)	F	p	d	M (SD)	M (SD)	M (SD)	Kruskal-Wallis	p
Adolescent age	14.90 (1.29)	14.90 (1.55)	0	1.00	.050	15.00 (1.41)	14.85 (1.46)	14.80 (1.48)	0.20	.906
Mother age	50.15 (6.22)	47.60 (4.38)	2.49	.142	.309	49.76 (4.94)	49.62 (6.90)	46.40 (3.66)	4.66	.097
Number of children	2.10 (0.79)	2.00 (0.80)	0.16	.692	.068	1.82 (0.73)	2.15 (0.69)	2.30 (0.95)	3.14	.208
Avoidant attachment-m	3.39 (1.44)	3.25 (1.23)	0.11	.745	.062	3.24 (1.30)	3.27 (1.50)	3.51 (1.21)	0.52	.770
Avoidant attachment-a	3.92 (1.48)	3.57 (1.26)	0.66	.421	.124	3.94 (1.32)	3.79 (1.43)	3.34 (1.42)	1.68	.432
Anxious attachment-m	3.04 (1.18)	3.02 (1.47)	<0.01	.960	.050	2.76 (0.94)	3.34 (1.43)	3.09 (1.72)	0.68	.710
Anxious attachment-a	3.40 (1.21)	2.89 (0.95)	2.15	.151	.298	3.27 (1.39)	2.98 (0.87)	3.16 (0.87)	0.33	.848
Internalizing problems-m	5.00 (3.03)	6.05 (3.69)	0.97	.331	.160	4.59 (2.69)	6.00 (4.00)	6.40 (3.47)	3.78	.378
Internalizing problems-a	3.90 (2.34)	3.70 (2.89)	0.06	.811	.056	3.35 (2.98)	3.85 (2.70)	4.50 (1.65)	1.66	.437
Externalizing problems-m	9.00 (5.87)	8.80 (5.15)	0.01	.909	.051	7.59 (5.12)	8.85 (5.30)	11.20 (5.94)	2.39	.303
Externalizing problems-a	4.25 (2.77)	4.55 (2.82)	0.12	.736	.063	4.29 (2.87)	4.62 (2.66)	4.30 (2.98)	0.16	.921

Note. Unemployed included students and retired and unemployed persons. ^bNon-Italian nationality included Spanish, Dutch, and Peruvian nationalities. ^cPsychological support (i.e., family therapy, individual therapy, group therapy) received by mothers before attending the Connect program or being included on the waitlist. % may not equal 100 due to rounding. -m = mother report. -a = adolescent report.

adolescent attachment insecurity and adolescent behavioral problems. Several studies have indicated that, over the course of development, individuals with anxious attachment have a higher risk of developing internalizing symptoms (Carlson & Sroufe, 1995; Colonesi et al., 2011; Dagan et al., 2018, 2020; Finnegan et al., 1996; Hodges et al., 1999), while those with avoidant attachment are at greater risk of developing externalizing symptoms (Bakermans-Kranenburg & van IJzendoorn, 2009; Kobak & Cole, 1994). However, studies have produced conflicting results about the precise forms of insecure attachment associated with specific behavioral problems (Brumariu & Kerns, 2010; Groh et al., 2012; Kerns & Brumariu, 2014; Madigan et al., 2013). In a similar vein, Moretti et al. (2015) found that parental participation in Connect reduced adolescent avoidant and anxious attachment, which were associated with decreased externalizing and internalizing symptoms, respectively. However, the study relied exclusively on parents' reports of adolescent functioning, did not use a randomized controlled trial (RCT) design, lacked a control group, and measured both behavioral problems and attachment only pre- and post-treatment. Therefore, the treatment outcomes require further investigation.

The present paper reports two experimental studies (Study 1, using mothers' reports only; Study 2, using a subsample of mothers' and adolescents' reports) using a longitudinal, multicenter, RCT design with three assessment points: pre-intervention (t1), 2 weeks post-intervention (t2), and a 4-month follow-up (t3). The following hypotheses were tested:

1. The Connect mother group would report a decrease in adolescent avoidant and anxious attachment and internalizing and externalizing problems, relative to the waitlist control mother group, at t2 and t3.
2. Mothers in the Connect parent group would report a decrease in adolescent attachment avoidance and anxiety at t2, which, in turn, would be associated with reduced externalizing problems and internalizing problems, respectively, at t3.

2. Study 1

2.1. Method

2.1.1. Participants

The sample comprised 100 mothers with adolescent children (60 male; 40 female) mean aged 14.89 years ($SD = 1.58$; age range: 12–18 years), living in Italy and belonging to two-parent intact families. The majority of mothers were Italian (89%) and employed (87%). Mothers were randomly assigned to the (Connect) intervention ($n = 50$ mothers) or the (waitlist) control ($n = 50$ mothers) group, following simple randomization procedures (computerized random numbers). Table 1 presents the detailed demographics for each time point, whereas Fig. 1 reports the attrition rate.

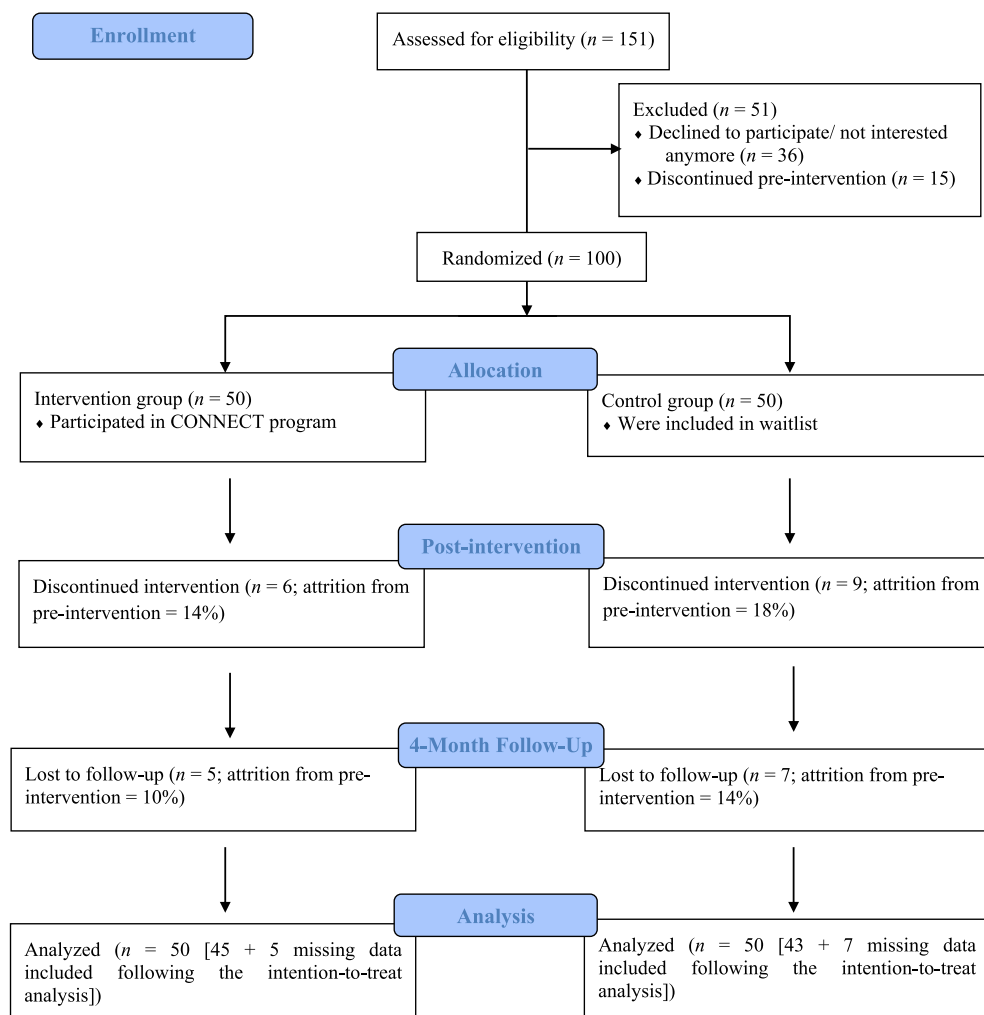


Fig. 1. CONSORT Flow Diagram for Sample (Dis)Engagement in Study 1 (N = 100).

2.1.2. Procedure

Data were collected in Italy. The study was approved by the Ethics Committees of the Department of Brain and Behavioral Sciences of the University of Pavia (Pavia), Ospedale Maggiore Policlinico (Milan), and “Stella Maris Foundation” (Pisa). Mothers seeking consultation for their adolescent’s behavioral problems were referred by community mental health facilities or schools to one of three Italian mental health centers participating in the study (i.e., Lab on Attachment and Parenting, University of Pavia, Pavia; Foundation IRCCS Ca’ Granda Ospedale Maggiore Policlinico, Milan; Institute for Research Hospitalization and Health Care “Stella Maris Foundation”, Pisa). All mothers read an informed consent that fully described the assessment and study procedures and gave their written consent to participate. The intervention group participated in the Connect program while the control group received treatment-as-usual at their respective center; the control group was invited to participate in Connect only after the study completion. Given the small number of fathers participating in the program ($n = 38$), only mothers’ assessments were retained, to limit variability. All mothers attended at least 7 of the 10 sessions (70%); the mean participation rate was 91%.

2.1.3. Measures

Mothers were asked to complete the following measures at t1, t2, and t3:

2.1.3.1. Adolescent behavioral problems. Adolescent behavioral problems were assessed using the 25-item Strengths and Difficulties Questionnaire (SDQ-parent version; Goodman, 1997) on a 3-point Likert scale ranging from 0 (*not true*) to 2 (*certainly true*). Total scores of internalizing (Emotional Problems and Peer Problems subscales) and externalizing (Conduct Problems and Hyperactivity-Inattention subscales) problems were calculated, in accordance with Goodman et al. (2010). Cronbach’s alphas for parents’ reports of adolescent internalizing and externalizing problems were 0.79 and 0.82 at t1, 0.78 and 0.84 at t2, and 0.80 and 0.84 at t3, respectively.

Table 2

Associations Among, and Descriptives of, Adolescent Avoidant and Anxious Attachment and Internalizing and Externalizing Problems at Pre-Intervention, Post-Intervention, and a 4-Month Follow-Up, as Reported by Mothers in Study 1 (N = 100).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	Connect Group M (SD)	Control Group M (SD)
1. Avoidant attachment t1	1	.181	.184	.049	.044	.048	.057	-.042	.021	.027	.127	.148	3.71 (1.42)	3.30 (1.32)
2. Avoidant attachment t2	.210	1	.583***	-.167	.135	.082	.409**	.463**	.388**	.054	.103	.033	3.16 (1.20)	3.68 (1.26)
3. Avoidant attachment t3	.109	-.020	1	-.164	.127	.177	.251	.296*	.370**	-.005	.041	.077	3.28 (1.01)	4.06 (0.98)
4. Anxious attachment t1	.085	-.190	.094	1	.264	.259 [†]	.234	.231	.118	.310*	.215	.175	3.29 (1.24)	2.86 (1.26)
5. Anxious attachment t2	-.297*	-.052	.101	.396**	1	.494***	.180	.155	.088	.373**	.331*	.327*	2.74 (1.13)	3.99 (1.64)
6. Anxious attachment t3	.039	.169	.497***	.215	.252 [†]	1	.083	.013	.024	.314*	.135	.131	2.67 (0.96)	3.64 (1.53)
7. Externalizing problems t1	.111	.344*	-.039	.299*	.326*	.281*	1	.763***	.837***	.315*	.251 [†]	.278 [†]	9.08 (4.62)	8.28 (5.21)
8. Externalizing problems t2	-.109	.397**	-.149	.137	.369**	.153	.754***	1	.859***	.258 [†]	.465**	.332*	7.64 (4.13)	8.74 (5.38)
9. Externalizing problems t3	-.213	.343*	.118	.015	.311*	.253 [†]	.582***	.655***	1	.216	.351*	.355*	7.66 (4.00)	9.92 (5.27)
10. Internalizing problems t1	.005	.015	.022	.278 [†]	.263 [†]	.243 [†]	.636***	.336*	.168	1	.707***	.734***	6.66 (4.23)	6.80 (4.18)
11. Internalizing problems t2	-.317*	.167	-.100	.066	.456**	.058	.391**	.701***	.344*	.460**	1	.818***	5.12 (3.87)	6.92 (4.38)
12. Internalizing problems t3	-.263 [†]	.301*	.129	-.078	.338*	.247 [†]	.409**	.489***	.657***	.367**	.583***	1	5.08 (3.42)	7.18 (4.37)

Note. Associations for the Connect group are displayed above the diagonal, whereas associations for the control group are displayed below the diagonal. t1 = pre-intervention; t2 = post-intervention; t3 = follow-up. [†] $p < .09$. * $p < .05$. ** $p < .01$. *** $p < .001$.

2.1.3.2. Adolescent anxious and avoidant attachment. Anxious (9 items; e.g., “My youth needs a lot of reassurance that he/she is loved by me”) and avoidant attachment (7 items; e.g., “My youth gets uncomfortable when I want to be close to him/her”) in the parent–adolescent relationship were assessed using the 16-item short version of the Adolescent Attachment Anxiety & Avoidance Inventory (AAAAI; Moretti & Obsuth, 2009). In this measure, each statement is rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In the present study, Cronbach’s alphas for anxious and avoidant attachment were 0.69 and 0.68 at t1, 0.71 and 0.71 at t2, and 0.70 and 0.69 at t3, respectively.

2.1.4. Intervention program

In each center, the Connect parent group program (Moretti et al., 2009) was delivered by two certified leaders who guided groups of 8–14 mothers through 10 90-min sessions. Aimed at strengthening the building blocks of secure attachment, each Connect parent group session began with a discussion of an attachment principle focused on adolescence and common challenges in the parent–adolescent relationship (e.g., “conflict is part of attachment,” “autonomy includes connection,” “balancing our needs with the needs of others”). Experiential exercises and role plays were used to help mothers identify and regulate their emotional reactions to their adolescent’s problem behavior; encourage parental reflection on the attachment needs associated with their adolescent’s behavior and state of mind; and support mothers in sensitively responding to challenging adolescent behavior while maintaining clear expectations and limits. Overall, the main goals of Connect parent group were to reduce mothers’ reliance on coercive or unproductive parenting strategies (Moretti et al., 2009); encourage them to “step back” from immediate emotional reactions and “step into” their adolescent’s state of mind; and promote mindfulness, availability, and empathic awareness of the attachment needs underlying their adolescent’s behavior (for more detail, see Moretti et al., 2018).

2.1.5. Data analysis

All analyses were conducted using R software (R Core Team, 2021). For mothers in both groups, missing data at t2 and t3 with respect to outcome variables (i.e., reports of adolescents’ avoidant attachment, anxious attachment, internalizing problems, and externalizing problems) (see Fig. 1) were treated according to intention-to-treat principles (White et al., 2012). Specifically, all mothers who completed baseline assessments ($n = 100$) were included in the final analysis. As shown in Fig. 1, data were missing for 15 participants (6 in the intervention group, 9 in the control group) at post-intervention and 12 participants (5 in the intervention group, 7 in the control group) at 4-month follow-up. Missing data were handled using multiple imputation with 20 imputations. Finally, as recommended by the National Academy of Sciences (Little et al., 2012), sensitivity analyses were further conducted to assess the robustness of findings to plausible alternative assumptions about the missing data. These analyses are presented as Supplemental Material.

To check whether group and/or center affected the sociodemographic (i.e., mothers’ age, education, participation in a prior psychological support intervention, number of children; adolescents’ age and gender) and outcome variables (i.e., avoidant and anxious attachment, internalizing and externalizing problems) at t1, chi-square tests and analyses of variance (ANOVAs) were performed, respectively. Effect sizes were calculated using Cohen’s (1988) d statistic (small: $d = 0.20$; medium: $d = 0.50$; large: $d = 0.80$).

To test the first hypothesis, four mixed models were performed—one for each outcome (i.e., adolescents’ avoidant attachment, anxious attachment, internalizing problems, and externalizing problems)—with group, time, and their interaction as fixed effects and the intercept and center as random effects. Furthermore, adolescents’ gender was entered as a covariate for models containing internalizing and externalizing problems as outcomes, given that gender has been shown to play a meaningful role in child behavioral adjustment (Rescorla et al., 2007). The mixed model design enabled us to control for the nested nature of the data (i.e., the same adolescent was evaluated by their mother across three time points, and thus 300 observations were available for each outcome variable; Detry & Ma, 2016; Kenny et al., 2020). Subsequently, to understand the nature of the interaction between time and group, a simple effect analysis was run.

To test the second hypothesis, two double mediation models were performed (one for each outcome; *lavaan* R package), with confidence intervals computed using the bootstrap percentiles method and 5000 bootstrap replications (Baron & Kenny, 1986). Group (waitlist control group = 0; Connect group = 1) was entered as a predictor, changes in adolescents’ attachment avoidance and anxiety (calculated as the difference in scores from t1 to t2) as mediators, t3 adolescents’ internalizing/externalizing problems as outcomes, and adolescents’ gender (coded as male = 1; female = 2) as a covariate. To examine the unique impact of pre–post intervention changes in attachment avoidance and anxiety on internalizing and externalizing problems at t3, mediational analyses were controlled for internalizing and externalizing problems at t1 (Rausch et al., 2003).

3. Results

3.1. Preliminary analyses

As displayed in Table 1, no differences were found at t1, with respect to either group or center, regarding mothers’ age, education, nationality, working status, participation in a prior psychological support intervention, and number of children, or adolescents’ age and gender. Connect and control mothers reported similar levels of adolescent avoidant and anxious attachment and internalizing and externalizing problems at t1. Table 2 shows the associations among the study variables at each time point, by group.

Table 3

Double mediation models with post-intervention changes in adolescent avoidant and anxious attachment as mediators of the effect of Connect on adolescent internalizing problems at a 4-month follow-up in study 1 and study 2.

Outcome: Internalizing problems (t3)	Effect	Study 1 (N = 100 mothers)						Study 2 (N = 40 mothers and 40 adolescents)					
		Estimate	SE	95% C.I.		β	p	Estimate	SE	95% C.I.		β	p
				Lower	Upper					Lower	Upper		
Type													
Indirect Component	Group \Rightarrow Avoidant attachment \Rightarrow Internalizing problems	-0.288	0.234	-0.815	0.103	-.036	.217	-0.022	0.275	-0.515	0.615	-.003	.937
	Group \Rightarrow Anxious attachment \Rightarrow Internalizing problems	-1.060	0.529	-2.197	-0.134	-.133	.045	-1.071	0.527	-2.219	-0.080	-.147	.042
	Group \Rightarrow Avoidant attachment	-0.947	0.334	-1.629	-0.298	-.279	.005	-1.259	0.372	-1.995	-0.552	-.352	<.001
	Avoidant attachment \Rightarrow Internalizing problems	0.304	0.218	-0.115	0.738	.130	.163	0.017	0.211	-0.411	0.417	.082	.935
	Group \Rightarrow Anxious attachment	-1.685	0.296	-2.248	-1.107	-.492	<.001	-1.773	0.322	-2.394	-1.134	-.525	<.001
Direct	Anxious attachment \Rightarrow Internalizing problems	0.629	0.280	0.082	1.181	.271	.025	0.604	0.270	0.048	1.133	.279	.025
	Group \Rightarrow Internalizing problems	-0.700	0.760	-2.222	0.761	-.088	.357	-0.796	0.801	-2.471	0.736	-.109	.321
Total	Group \Rightarrow Internalizing problems	-2.027	0.665	-3.329	-0.724	-.252	.002	-1.837	0.724	-3.256	-0.418	-.248	.011

Note. Group coded as: 0 = control group, 1 = Connect group. C.I. = confidence intervals. Confidence intervals were evaluated using the bootstrap percentiles method. In both Study 1 and Study 2, analyses were controlled for adolescents' gender (coded as 1 = male, 2 = female) (Study 1 estimate = -0.360, SE = 0.671, C.I. = -1.692, 0.972, β = -0.044, p = .593; Study 2 estimate = -0.609, SE = 0.739, C.I. = -2.080, 0.862, β = -0.080, p = .412); and pre-intervention internalizing problems (Study 1 estimate = 0.476, SE = 0.077, C.I. = 0.323, 0.628, β = 0.492, p < .001; Study 2 estimate = 0.355, SE = 0.095, C.I. = 0.166, 0.544, β = 0.372, p < .001).

Table 4

Double mediation models with post-intervention changes in adolescent avoidant and anxious attachment as mediators of the effect of Connect on adolescent externalizing problems at a 4-month follow-up in study 1 and study 2.

Outcome: Externalizing problems (t3)	Effect	Study 1 (N = 100 mothers)					Study 2 (N = 40 mothers and 40 adolescents)						
		Estimate	SE	95% C.I.		β	p	Estimate	SE	95% C.I.		β	p
				Lower	Upper					Lower	Upper		
Type													
Indirect	Group \Rightarrow Avoidant attachment \Rightarrow Externalizing problems	-0.534	0.258	-1.112	-0.098	-.058	.039	-0.773	0.358	-1.547	-0.153	-.084	.031
	Group \Rightarrow Anxious attachment \Rightarrow Externalizing problems	-0.647	0.498	-1.743	0.259	-.070	.194	-0.121	0.585	-1.094	1.232	-.013	.836
Component	Group \Rightarrow Avoidant attachment	-0.947	0.334	-1.609	-0.308	-.279	.005	-1.259	0.385	-2.029	-0.514	-.352	.001
	Avoidant attachment \Rightarrow Externalizing problems	0.564	0.213	0.154	1.005	.207	.008	0.614	0.237	0.147	1.068	.238	.010
	Group \Rightarrow Anxious attachment	-1.685	0.299	-2.271	-1.099	-.493	<.001	-1.773	0.330	-2.402	-1.123	-.525	<.001
Direct	Anxious attachment \Rightarrow Externalizing problems	0.384	0.270	-0.160	0.911	.142	.155	0.068	0.326	-0.641	0.641	.025	.834
	Group \Rightarrow Externalizing problems	-1.581	0.749	-3.019	-0.074	-.171	.035	-1.640	1.129	-3.952	0.426	-.178	.146
Total	Group \Rightarrow Externalizing problems	-2.788	0.680	-4.121	-1.454	-.293	.001	-2.562	0.814	-4.157	-0.967	-.265	.002

Note. Group coded as: 0 = control group, 1 = Connect group. C.I. = confidence intervals. Confidence intervals were evaluated using the bootstrap percentiles method. In both Study 1 and Study 2, analyses were controlled for adolescents' gender (coded as 1 = male, 2 = female) (Study 1 estimate = -1.089, SE = 0.722, C.I. = -2.523, 0.345, β = -0.112, p = .135; Study 2 estimate = -2.034, SE = 0.853, C.I. = -3.734, -0.335, β = -0.206, p = .020); and pre-intervention externalizing problems (Study 1 estimate = 0.573, SE = 0.072, C.I. = 0.430, 0.716, β = 0.588, p < .001; Study 2 estimate = 0.422, SE = 0.088, C.I. = 0.247, 0.596, β = 0.447, p < .001).

3.2. Effectiveness of the Connect parent group intervention in reducing adolescent attachment insecurity and behavioral problems at t2 and t3 (mothers' reports)

Regarding adolescents' attachment insecurity, two mixed models—for avoidant and anxious attachment, respectively—were run with group, time, and their interaction as fixed effects, and the intercept and center as random effects. No time effect was found for avoidant ($F [2196] = 1.34, p = .264, d = 0.434$) or anxious attachment ($F [2196] = 1.90, p = .152, d = 0.393$). A group effect was detected for anxious attachment ($F [1,98] = 10.03, p = .002, d = 0.880$), with Connect mothers reporting lower adolescent attachment anxiety than control mothers; however, no such effect was found for avoidant attachment ($F [1,98] = 3.13, p = .080, d = 0.354$). Finally, the interaction between group and time was significant for both avoidant ($F [2196] = 8.38, p < .001, d = 0.928$) and anxious attachment ($F [2196] = 17.27, p < .001, d = 1.000$). Two simple effects analyses highlighted that Connect was effective in reducing mothers' perception of adolescent avoidant (estimate = $-0.515, SE = 0.241, p = .034$) and anxious attachment (estimate = $-1.255, SE = 0.026, p < .001$) at t2. Further, these changes remained stable over time, since Connect mothers continued to perceive lower adolescent avoidant (estimate = $-0.775, SE = 0.241, p = .001$) and anxious attachment (estimate = $-0.976, SE = 0.260, p < .001$) relative to control mothers at t3. Overall, the models explained 25% (R^2 conditional = 0.250) and 39% (R^2 conditional = 0.387) of the variance in avoidant and anxious attachment, respectively.

Regarding adolescent behavioral problems, two further mixed models—for internalizing and externalizing problems, respectively—were run with group, time, their interaction, and adolescent's gender as fixed effects, and the intercept and center as random effects. The findings indicated no time effect for internalizing ($F [2196] = 2.14, p = .121, d = 0.247$) or externalizing problems ($F [2196] = 1.60, p = .205, d = 0.543$). A group effect was detected for internalizing problems ($F [1,96] = 4.07, p = .047, d = 0.475$), with Connect mothers reporting lower adolescent internalizing problems than control mothers; no such effect was found for externalizing problems ($F [1,96] = 1.28, p = .262, d = 0.201$). Gender was a significant covariate for externalizing problems ($F [1,97] = 6.61, p = .012, d = 0.785$), with male adolescents showing more externalizing problems than female adolescents, but not for internalizing problems ($F [1,97] = 0.17, p = .681, d = 0.051$). Finally, the interaction between group and time was significant for internalizing ($F [2196] = 4.08, p = .018, d = 0.597$) and externalizing problems ($F [2196] = 9.34, p < .001, d = 0.950$). Simple effects analyses indicated that Connect was effective in reducing mothers' perceptions of adolescent internalizing (estimate = $-1.839, SE = 0.809, p = .024$) and externalizing problems (estimate = $-1.900, SE = 0.930, p = .009$) at t2. These changes remained stable over time, since Connect mothers continued to perceive lower adolescent internalizing (estimate = $-2.139, SE = 0.809, p = .009$) and externalizing problems (estimate = $-2.348, SE = 0.930, p = .013$) relative to control mothers at t3. Overall, the models explained 62% (R^2 conditional = 0.617) and 73% (R^2 conditional = 0.732) of the variance in internalizing and externalizing problems, respectively. [Table 2](#) displays the means and standard deviations at each time point.

3.3. Associations between changes in anxious and avoidant attachment at t2 and reductions in internalizing and externalizing problems at t3 (mothers' reports)

Two double mediation models were run to test whether changes in mothers' reports of adolescent anxious and avoidant attachment at 2-weeks post-intervention (t2) led to fewer adolescent internalizing and externalizing behaviors at a 4-month follow-up (t3). Full model results are displayed in [Tables 3 and 4](#). As expected, mothers who participated in the Connect program reported fewer adolescent internalizing and externalizing problems at t3, following a decrease in adolescent anxious and avoidant attachment, respectively, at t2. Of relevance, changes in anxious attachment did not mediate reductions in externalizing problems, and changes in avoidant attachment did not mediate reductions in internalizing problems.

4. Study 2

4.1. Method

4.1.1. Participants

Of the 100 mothers from Study 1, in 40 cases questionnaires were also filled out by their adolescent children. This subsample of 40 mothers and their 40 adolescents ($n = 80$) constituted the participants of Study 2. The attrition rate from t1 to t2 was 11% (Connect group: $n = 1$ mother, $n = 4$ adolescents; control group: $n = 5$ adolescents); and 14% from t1 to t3 (Connect group: $n = 1$ mother, $n = 3$ adolescents; control group: $n = 1$ mother, $n = 6$ adolescents). Independent samples t-tests revealed no significant differences between participating and non-participating families in Study 2 (relative to Study 1), in terms of adolescent demographics (e.g., mean age, gender) or mothers' reports of adolescent anxious and avoidant attachment and internalizing and externalizing behaviors at t1. [Table 1](#) reports the participant characteristics.

4.1.2. Measures

Mothers had already completed questionnaires for Study 1, and adolescents were administered the SDQ (self-report; [Goodman, 1997](#)) and AAAAI (youth-version; [Moretti & Obsuth, 2009](#)) at t1, t2, and t3. Cronbach's alphas for mothers' reports of adolescent internalizing and externalizing problems were 0.78 and 0.80 at t1, 0.77 and 0.80 at t2, and 0.81 and 0.82 at t3, respectively; Cronbach's alphas for adolescents' reports of internalizing and externalizing problems were 0.75 and 0.77 at t1, 0.76 and 0.79 at t2, and 0.80 and 0.81 at t3, respectively. Cronbach's alphas for mothers' reports of adolescent anxious and avoidant attachment were 0.68 and 0.68 at t1, 0.71 and 0.72 at t2, and 0.71 and 0.67 at t3, respectively; Cronbach's alphas for adolescents' reports of anxious and avoidant

attachment were 0.66 and 0.67 at t1, 0.70 and 0.72 at t2, and 0.72 and 0.71 at t3, respectively.

4.1.3. Data analysis

The data analysis was similar to that of Study 1, with the following exceptions: (a) for preliminary analyses of the potential effect of group and center on sociodemographic and outcome variables at t1, Fisher's exact and Kruskal-Wallis tests were used, respectively, given that some expected cell counts were less than 5 and data were distributed non-normally; (b) for the first hypothesis, reporter (mother vs. adolescent) was added as a further random effect; and (c) for the second hypothesis, correlations between variable residuals were included in the double mediation models to account for the mutual dependence of the mothers' and adolescents' reports (Bollen, 1989).

5. Results

5.1. Effectiveness of Connect in reducing adolescent attachment insecurity and behavioral problems at t2 and t3 (mothers' and adolescents' reports)

Table 5 displays within mother-adolescent dyad associations of avoidant and anxious attachment, and internalizing and externalizing problems at each time point. When the reports of both mothers and adolescents were considered, the interaction between group and time was significant for both adolescent avoidant ($F [2232] = 3.06, p = .049, d = 0.621$) and adolescent anxious attachment ($F [2195] = 5.45, p = .005, d = 0.995$). Simple effects analyses indicated that adolescents' avoidant and anxious attachment decreased in the Connect group at both t2 (attachment avoidance estimate = $-0.782, SE = 0.351, p = .027$; attachment anxiety estimate = $-0.883, SE = 0.339, p = .010$) and t3 (attachment avoidance estimate = $-0.851, SE = 0.351, p = .016$; attachment anxiety estimate = $-1.157, SE = 0.339, p < .001$). Furthermore, the Connect group reported lower attachment avoidance ($F [1234] = 5.21, p = .023, d =$

Table 5
Adolescent Avoidant and Anxious Attachment and Internalizing and Externalizing Problems, as Reported by Mothers and Adolescents in Study 2 (N = 40 mothers and 40 adolescents).

	Connect group M (SD)	Control group M (SD)
Avoidant attachment t1	$r = -.29$	$r = .34$
mother report	3.39 (1.44)	3.25 (1.23)
adolescent report	3.92 (1.48)	3.57 (1.26)
Avoidant attachment t2	$r = -.10$	$r = .49^*$
mother report	3.41 (1.41)	3.74 (1.16)
adolescent report	2.74 (0.70)	3.51 (1.30)
Avoidant attachment t3	$r = < .01$	$r = .27$
mother report	3.31 (1.16)	3.89 (0.84)
adolescent report	3.26 (0.97)	4.02 (1.13)
Anxious attachment t1	$r = -.40^{\dagger}$	$r = .14$
mother report	3.04 (1.19)	3.02 (1.47)
adolescent report	3.40 (1.21)	2.89 (0.95)
Anxious attachment t2	$r = .11$	$r = .43^{\dagger}$
mother report	2.53 (0.81)	4.08 (1.59)
adolescent report	3.13 (1.29)	3.49 (1.70)
Anxious attachment t3	$r = -.13$	$r = .12$
mother report	2.17 (0.62)	3.58 (1.54)
adolescent report	3.04 (1.13)	3.72 (1.56)
Externalizing problems t1	$r = .17$	$r = .08$
mother report	9.00 (5.87)	8.80 (5.15)
adolescent report	4.25 (2.77)	4.55 (2.82)
Externalizing problems t2	$r = .47^*$	$r = .59^{**}$
mother report	7.05 (4.55)	9.70 (5.56)
adolescent report	6.95 (3.97)	7.70 (4.77)
Externalizing problems t3	$r = .73^{***}$	$r = .22$
mother report	6.85 (4.60)	10.00 (5.51)
adolescent report	7.50 (3.80)	9.10 (5.08)
Internalizing problems t1	$r = .16$	$r = .49^*$
mother report	5.00 (3.03)	6.05 (3.69)
adolescent report	3.90 (2.34)	3.70 (2.89)
Internalizing problems t2	$r = .17$	$r = .27$
mother report	3.85 (3.07)	6.35 (4.30)
adolescent report	4.90 (3.57)	6.70 (3.66)
Internalizing problems t3	$r = .48^*$	$r = .01$
mother report	3.75 (2.53)	6.40 (3.70)
adolescent report	5.05 (2.65)	7.10 (4.88)

Note. r = Pearson correlation among mothers' and adolescents' reports on the same variable.

$^{\dagger}p < .09$. $*p < .05$. $**p < .01$. $***p < .001$.

0.385) and anxiety ($F [1,38] = 7.77, p = .008, d = 0.610$) in their adolescent children. No significant effect was found for time (attachment avoidance: $F [2232] = 0.97, p = .383, d = 0.321$; attachment anxiety, $F [2195] = 2.51, p = .084, d = 0.253$). Overall, the models explained 6% (R^2 conditional = 0.056) and 15% (R^2 conditional = 0.152) of the variance in avoidant and anxious attachment, respectively.

The interaction between group and time was also significant for adolescent internalizing, $F (2,195) = 4.79, p = .009, d = 0.662$, and externalizing problems, $F (2,195) = 9.29, p < .001, d = 0.663$. Simple effects analyses indicated that internalizing and externalizing problems decreased in the Connect group at both t2 (internalizing problems estimate = $-3.120, SE = 0.851, p < .001$; externalizing problems estimate = $-1.727, SE = 1.190, p = .047$) and t3 (internalizing problems estimate = $-3.950, SE = 0.851, p < .001$; externalizing problems estimate = $-4.327, SE = 1.190, p < .001$). Group had a significant effect on internalizing problems ($F [1,35] = 16.79, p < .001, d = 0.652$), with lower levels in the Connect group relative to the control group, but not on externalizing problems ($F [1,35] = 3.45, p = .071, d = 0.261$). Time was not significant for either internalizing ($F [2195] = 2.45, p = .089, d = 0.239$) or externalizing problems ($F [2195] = 1.26, p = .285, d = 0.862$). Finally, male adolescents showed more externalizing problems than female adolescents ($F [1,36] = 6.07, p = .019, d = 0.612$), whereas internalizing problems did not differ between genders ($F [1,36] = 0.26, p = .616, d = 0.062$). Overall, the models explained 46% (R^2 conditional = 0.455) and 50% (R^2 conditional = 0.495) of the variance in internalizing and externalizing problems, respectively.

5.2. Decrease in anxious and avoidant attachment at t2 as a mechanism of change for reduced internalizing and externalizing problems, respectively, at t3 (mothers' and adolescents' reports)

The inclusion of both mothers' and adolescents' reports in the two double mediation models confirmed the pathways found in Study 1. As shown in [Tables 3 and 4](#), mothers who participated in the Connect parent group program reported reductions in adolescent anxious and avoidant attachment at t2, which subsequently resulted in decreased adolescent internalizing and externalizing problems, respectively, at t3. Again, no significant mediation of changes in avoidant attachment on internalizing symptoms or changes in anxious attachment on externalizing symptoms was found.

6. Discussion

Using a longitudinal, multicenter, RCT design, the present research investigated the effectiveness of the attachment-based parenting intervention Connect ([Moretti et al., 2009](#)), in reducing adolescent behavioral problems and attachment insecurity at 2 weeks post-intervention and a 4-month follow-up in two studies. Study 1 used only mothers' reports, whereas Study 2 used both mothers' and adolescents' reports. The research further investigated whether post-intervention decreases in adolescent avoidant and anxious attachment accounted for changes in adolescent externalizing and internalizing problems, respectively, at follow-up.

In line with the first hypothesis, mothers who participated in the Connect program reported significantly reduced adolescent behavioral problems and attachment insecurity, relative to mothers in the waitlist group, both 2 weeks and 4 months post-intervention (Study 1). These findings were confirmed when adolescents' reports were combined with those of their mothers (Study 2). The significant improvement in adolescent behavioral problems reported by the Connect parent group mothers, relative to the waitlist mothers, echoes the findings of a prior RCT involving Somali-born parents in Sweden ([Osman et al., 2017a](#)) and non-RCTs conducted in Canada, suggesting reduced parent-reported adolescent behavioral problems ([Moretti et al., 2015, 2018; Moretti & Obsuth, 2009](#)) and attachment insecurity ([Moretti et al., 2015](#)) following participation in Connect.

Both of the present studies found larger improvements in adolescent internalizing problems, relative to externalizing problems, following the Connect intervention. This differs from the results of [Osman et al. \(2017a\)](#), showing that Connect was more effective in reducing externalizing ($d = 0.60$) than internalizing ($d = 0.16$) problems. Differences in sample composition and follow-up time might have led to these discrepancies. Furthermore, although the Connect program involves a manualized—and thus ostensibly universally consistent—participant introduction at intake, the Italian Connect leaders in the present research might have emphasized to mothers that Connect would help them more effectively reflect on and give meaning to their adolescents' signals of emotional distress. This being the case, mothers might have emerged from the program more sensitive or attentive to their adolescents' internal emotional cues, such as sadness, somatic complaints, loneliness, and worry. In terms of effectiveness over time, in both studies, mothers continued to perceive great improvements in their adolescents' problem behaviors following Connect, with effect sizes larger at follow-up than at post-intervention.

The second hypothesis was confirmed in both studies, consistent with [Moretti et al.'s \(2015\)](#) findings. Specifically, controlling for pre-intervention symptoms, adolescents whose mothers participated in the Connect program showed fewer internalizing and externalizing problems at follow-up via decreased anxious and avoidant attachment, respectively, 2 weeks post-intervention. A consideration of the theoretical links between attachment insecurity and behavioral problems in childhood may help explain these findings. It has been hypothesized that avoidant children's self-reliance, reduced regard for others' needs, and anger in attachment relationships may predispose them to externalizing difficulties ([Carlson & Sroufe, 1995; Finnegan et al., 1996](#)). In fact, over the course of development, in contrast to anxious adolescents, avoidant adolescents may be more likely to present externalizing behaviors to distract from attachment-related cues ([Bakermans-Kranenburg & van IJzendoorn, 2009; Kobak & Cole, 1994](#)).

Of relevance, firm conclusions about the associations between attachment anxiety and internalizing symptomatology are difficult to draw, given inconsistent findings in the literature ([Brumariu & Kerns, 2010; Colonna et al., 2011; Groh et al., 2012; Kerns & Brumariu, 2014; Madigan et al., 2013](#)). The present results, however, support Perry et al.'s idea ([Finnegan et al., 1996; Hodges et al., 1999](#)) that anxious-ambivalent attachment is more strongly associated with internalizing symptoms than avoidant attachment or

insecure attachment in general. Ambivalent infants are inhibited in their autonomy and exploration due to their experiences of a caregiver with unpredictable and irregular responsiveness, and they also struggle to regulate emotions, even during minor stressors; similarly, preoccupied adolescents may present chronic vigilance, fear responses, and self-perceived weakness and helplessness. These responses, which are typical of preoccupied adolescents, have been proposed to be associated with internalizing symptoms (Colonnesi et al., 2011). Furthermore, the present finding of an association between attachment anxiety and internalizing problems is consistent with the observation of Brumariu and Kerns (2010) that, in preadolescence and adolescence, when disorganized attachment is not considered (as it was not in the present research), anxious-ambivalent attachment poses the highest risk for internalizing symptoms.

Along with the strengths already mentioned (i.e., the inclusion of both mothers' and adolescents' reports and the multicenter experimental RCT design), a further strength of the two studies was the very low attrition rate across the three waves of data collection and the re-uptake of some participants at follow-up who did not complete measures post-intervention. This is in line with the Connect program structure, which includes meeting in advance of treatment to identify and collaboratively manage barriers; preventing a prescriptive approach (which is often experienced as blaming); empathizing with—but not condoning—problematic parenting behavior; and encouraging autonomy in parental functioning. All of these evidence-based strategies aim at removing treatment barriers and enhancing parents' motivation (Snell-Johns et al., 2004).

Several limitations of the study should be acknowledged. First, the follow-up time point at only 4 months post-intervention limits our confidence in the findings over the longer term. Second, the exclusive reliance on questionnaires may have produced shared method variance and larger effect sizes, particularly for the association between attachment and internalizing behavior, as recently shown by Madigan et al. (2016). To the extent that attachment measures differ in their ability to contact strategic (conscious) or automatic (unconscious) processes (Bosmans & Kerns, 2015), use of the Adult Attachment Interview (George et al., 1985) in future intervention studies may be helpful for determining whether participation in Connect promotes a more crucial shift from insecure to secure attachment, instead of merely detecting changes in attachment insecurity dimensions (i.e., avoidant or anxious). Third, the present study did not assess co-occurrence between internalizing and externalizing problems. Although generally conceptualized as distinct psychopathological domains, internalizing and externalizing problems have been found to co-occur during every developmental stage, across both clinical and non-clinical samples (Gilliom & Shaw, 2004). Finally, although all adolescents were asked to fill out questionnaires, only 40% did. In this vein, the low participation of adolescents in Study 2 may represent a bias for results: it cannot be excluded, in fact, that those experiencing more difficulties were more reluctant to participate. However, mothers' reports of adolescent attachment insecurity and behavioral problems did not indicate any differences between the participating and non-participating adolescents.

7. Practical implications and future directions

Adolescence is marked by struggles for autonomy, maintenance of parental attachment (Kobak et al., 2007; McElhaney et al., 2009), and unique neurobiological, cognitive, and social-relational changes (Crone & Dahl, 2012; Sercombe, 2014). Unsurprisingly, under these circumstances, adolescents may not be ready to face their behavioral difficulties alone, and their direct involvement in treatment may be challenging. Furthermore, parents often struggle to find support for the specific difficulties involved in raising adolescent offspring (Barone et al., 2020). The present findings indicate that helping mothers to see, understand, and respond sensitively to the attachment nuances of their adolescents' behavior, as well as to reframe their understanding of conflict in the mother–adolescent interaction, can be enormously beneficial in reducing behavioral problems in their offspring. Additionally, shifting mothers' attention away from their adolescents' challenging behaviors and toward the identification and celebration of relational connection may restore a more secure path and shared partnership, with positive implications for the adolescent's further healthy development (Moretti et al., 2018). In adolescence, fathers frequently play a significant role as disciplinarian (Allen & Tan, 2016), and the task of managing autonomy negotiations during father–adolescent conflict may threaten the security of this relationship. In light of the promising results found for mother–adolescent dyads in the present study, future studies should aim at involving fathers in the Connect parent group program to help fathers anticipate and cope with relational setbacks and to ensure that adolescents have a further secure base in their transition to adulthood.

In conclusion, while symptoms reduction is a common outcome in all parenting interventions, Connect further offers parents and practitioners a model of change representing an important extension of attachment theory and research. This model of change is particularly relevant for parents of adolescents seeking to better understand their offspring's attachment needs, particularly when these are expressed through angry, rejecting, or withdrawn behaviors (Moretti et al., 2015). Processes included in the proposed model of change (i.e., Connect participation \Rightarrow less attachment avoidance/anxiety \Rightarrow fewer externalizing/internalizing problems (respectively); Moretti et al., 2015) may be critical for other attachment-based interventions (e.g., attachment-based family therapy; Diamond, 2014), whereby therapists first work alone with parents to facilitate awareness and sensitivity to their adolescents' attachment injuries, then family sessions engage in reparative work aimed at increasing attachment security and providing a more stable foundation for adolescent growth and autonomy.

Most mental health problems arise in adolescence (Hofstra et al., 2000, 2002; Jones, 2013), with significant cost to the economy (Patel et al., 2018). Similarly, insecure attachment has been shown to have financial consequences (Bachmann et al., 2019). Therefore, it seems very fitting that effective interventions for adolescent behavioral problems and insecure attachment should be developed and disseminated, also in light of the National Research Council' and Institute of Medicine's (2009, p. 13) call to create "a society in which young people arrive at adulthood with the skills, interests, assets, and health habits needed to live healthy, happy, and productive lives in caring relationships with others." In this vein, given its brief and manualized structure, standardized training protocol, portability, and cost-effectiveness (Moretti et al., 2018), the Connect program represents a promising attachment-based parenting intervention for

improving and promoting the mental health of adolescents while reducing their cost to society.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.adolescence.2021.07.008>.

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