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Roger J.R. Levesque

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Dear Dr. Levesque,

We thank you again very much for the promptness of your response and the consideration of

our paper for publication.

We are really grateful to you for your last corrections. We incorporated all of them in this

current version.

We would like to express our gratitude to you for this remarkable editorial process.

Yours sincerely,

Gian Vittorio Caprara

Faculty of Medicine and Psychology "Sapienza" University of Rome

Why and How to Promote Adolescents' Prosocial Behaviors: Direct, Mediated and Moderated Effects of the

CEPIDEA School-Based Program

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Abstract

Prosocial behaviors are considered integral to intervention goals that seek to promote successful youth development. This study examines the effect of a school-based intervention program entirely designed to promote prosocial behaviors called Promoting Prosocial and Emotional Skills to Counteract Externalizing Problems in Adolescence (Italian acronym CEPIDEA). The CEPIDEA curriculum was incorporated into routine educational practices and included five major components that reflect the personal determinants of prosocial behavior during adolescence. The present study assessed 151 students (48.7% female; M_{age} = 12.4) of the intervention school and 140 students (51.2% female; M_{age} = 13.0) of the control school at three points. A multi-group latent curve analysis revealed that the intervention group, compared with the control group, showed an increase in prosocial behavior, interpersonal self-efficacy beliefs, and agreeableness along with a decrease in physical aggression above and beyond the normative developmental trend of the these variables. Participants of the intervention also obtained higher grades than the control group at the end of middle school. Moderation effects for prosocial behavior and agreeableness evidenced that those who benefited most from the intervention were those adolescents with lower normative development of prosocial behavior, low initial level of agreeableness, and high initial level of physical aggression. The results also showed that the increase of prosocial behaviors mediated the decline of verbal aggression in adolescents who had attended the intervention. These findings suggest that interventions aimed at promoting prosocial behaviors while having the potential to support positive outcomes may also counteract or redirect negative trajectories of functioning.

Keywords: school-based intervention; adolescence; prosocial behavior; aggressive behavior; scholastic achievement; latent growth curve.

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Introduction

Prosocial behavior refers to those voluntary actions aimed to benefit others, such as sharing, donating, caring, and comforting (Batson 2011). A large amount of empirical research has consistently documented the beneficial role of prosocial behavior both for the actor and the target (see Eisenberg et al. 2006). In particular, during adolescence, the enactment of prosocial behavior has been found to be positively associated with several positive developmental outcomes, such as academic achievement (e.g., Caprara et al. 2000; Youniss et al. 1999), self-esteem (Zuffianò et al. 2014) and civic engagement (Luengo Kanacri et al. 2014b). Prosocial behavior may also serve to counteract depression (Bandura et al. 1999) and detrimental conduct (Kokko et al. 2006; Pulkkinen and Tremblay 1992), including bullying behavior (e.g., Raskauskas et al. 2010). Accordingly, it is not surprising that in the arena of mental health programs, most of the effective school-based interventions assigned a relevant role to the promotion of prosocial behavior in sustaining optimal youth development (Durlak et al. 2011).

The literature pointed out how prosocial behavior is a relatively "malleable" variable that can be properly nurtured through appropriate educational actions (e.g., Bandura 1997; Carlo et al. 1999; Eisenberg et al. 2006). In this regard, the school context, given its important role as an agent of socialization, represents an optimal social and learning environment in which children and adolescents can be educated on prosocial values (Greenberg et al. 2003). In accordance with this educational perspective, a new universal school-based intervention, called Promoting Prosocial and Emotional Skills to Counteract Externalizing Problems in Adolescence (Italian acronym CEPIDEA), has been designed entirely for enhancing early adolescents' prosocial behavior within the classroom setting. A first evaluation of the CEPIDEA program indicated several promising positive effects (Caprara et al. 2014). In a quasi-experimental design in which 15 classrooms (in the same middle school) were assigned to the intervention versus control condition, the participants in the CEPIDEA intervention reported higher helping behavior and academic achievement as well as lower aggressive behavior compared to their counterparts at a six-month follow-up (Caprara et al. 2014).

The scope of this study is to investigate further the efficacy of the CEPIDEA program (a) by comparing the intervention group with a control group composed of classrooms belonging to a different middle-school and (b) by adopting a more long-term perspective in which the aforementioned main outcomes are evaluated at an 18-month follow-up (i.e., 1 year after the end of the intervention). Specifically, with regard to (a), one cannot exclude that the previous positive CEPIDEA effects (Caprara et al. 2014) have been underestimated because the intervention and control classrooms were in the same school. Indeed, control students could have been affected indirectly by the intervention through contamination effects because in most cases, children of the intervention

group had the same teachers as those in the control group (Cook and Campbell 1979). With regard to (b), the

goal is to see if the positive effects previously identified in the study by Caprara et al. (2014) (i.e., six months

after the end of the intervention, a 12-month follow-up) were maintained one year after the end of the CEPIDEA

program (i.e., an 18-month follow-up).

Positive Effects of Prosocial Behavior

Behaving prosocially seems to produce benefits for adolescent and youth development, both in

counteracting negative outcomes and in promoting better adjustment over the life course. From a preventive

outlook, prosocial behaviors might neutralize, inhibit, or arrest disruptive behaviors. In fact, empirical

corroborations have shown how adolescents who frequently display prosocial behaviors are less inclined to

show externalizing behaviors (e.g., Bandura et al. 1996; Eccles and Barber 1999; Youniss et al. 1999). However,

how the effect of prosocial behavior operates in reducing harmful conduct is still a matter of debate. For

instance, Kokko et al. (2006) specified two main processes through which prosocial behavior might exert an

effect on aggressive behaviors: compensatory and protective effects. *Compensatory additive effects* are defined

as the extent to which prosocial behavior (a positive effect) reduces the risk of aggression (a negative effect),

and a *protective effect* refers to the influence of prosocial behavior only on a high-risk adolescent. For universal

school-based interventions, such as CEPIDEA, compensatory additive effects are particularly interesting areas

of study. Many scholars agree that adolescents' aggressive behaviors partially stem from scarce behavioral

resources and assets (e.g., Dodge et al. 2006). Thus, promoting prosocial behavior and related competences in

schools can provide adolescents with an alternative positive behavioral repertoire, which enables them to

decelerate or interrupt patterns of maladjustment over time.

Regarding the beneficial role of prosocial behavior in promoting positive developmental outcomes,

empirical evidence has corroborated that prosocial adolescents show better peer relationships compared with

their less prosocial peers (Eisenberg et al. 2006), higher levels of self-esteem (Zuffianò et al. 2014), a sense of

belonging to the community context (e.g., Young and Glasgow 1998), and civic engagement during the

transition from adolescence to young adulthood (e.g., Luengo Kanacri et al. 2014b). Importantly, prosocial

adolescents also report better academic performance compared to their less prosocial peers (Bandura et al. 1996;

Eccles and Barber, 1999). Indeed, scholars found that early prosocial behavior strongly predicts academic

achievement five years later while controlling for previous academic performance (Caprara et al. 2000). This

result can be explained by considering that adolescents who behave prosocially are more likely to establish a

supportive social and learning environment in which they feel accepted and supported by their classmates and

teachers (e.g., Jennings and Greenberg 2009; Wentzel 1993). In sum, there is a considerable amount of

empirical evidence suggesting that fostering prosocial behavior at school can contribute to students' learning

and adjustment over time while protecting them against negative developmental outcomes, such as peer

rejection aggression and antisocial behavior.

Theoretical Model and Program Background

The theoretical rationale underlying our intervention derives from the ensemble of various research

backgrounds, such as personality, developmental, and social psychology, that address the personal roots of

prosocial behaviors. Personality psychologists, for instance, have pointed to a basic trait like agreeableness (i.e.,

the tendency to be likeable and harmonious in relation to others) as a major determinant of prosocial behavior

(Caprara et al. 2012; Graziano and Eisenberg 1997). Values related to self-transcendence, which emphasizes

accepting others as equals and displaying concern for their welfare (i.e., universalism and benevolence), are also

important motives for prosocial behaviors (e.g., Schwartz 2010). Moreover, the role of empathy and emotion-

regulation skills were considered relevant explanatory mechanisms of behaving prosocially by developmental

psychologists (Eisenberg et al. 2006). Feeling empathy and being able to manage one's own emotions increase

children's sensitivity toward others' needs and equip them with the necessary resources to avoid excessive

contagion from others' negative emotions (which may lead to emotional overarousal; Eisenberg et al. 2006).

Being emotionally adjusted also implies knowing when and how to express relevant positive emotions (e.g.,

gratitude and joy) that promote good interpersonal relationships. Recent longitudinal empirical findings stressed

that individual differences in prosociality are positively related to early capacity to be self-regulated emotionally

and behaviorally (e.g., Luengo Kanacri et al. 2013).

In addition, an important theoretical contribution to the study of the antecedents of prosocial behavior

is social cognitive theory (SCT; see Bandura 1997). According to SCT, self-efficacy beliefs (i.e., individuals'

confidence in their abilities across different domains of functioning) have been identified as proximal predictors

of behaviors (Caprara et al. 2012). In particular, interpersonal self-efficacy beliefs during adolescents' lives may

exert a crucial influence on their tendency to behave prosocially, especially among peers. Adolescents'

judgments about their abilities to interact with peers in situations of need, to constructively stay and

communicate in the class group, and to sense another classmate's feelings may support the enactment of

prosocial behavior. An adequate level of these interpersonal self-efficacy beliefs can help adolescents to deal

properly with the daily relationships in the classroom context and mitigate the negative consequences of

unsuccessful social interactions—such as aggression, submission, or ignoring or denying other points of view (see Bandura 1997).

In sum, our program background tried to combine harmoniously the contributions deriving from different theoretical approaches to promote prosocial behavior. For example, trait theory points to the inherited foundations of prosocial dispositions while SCT recognizes the influence of socialization and culture in nurturing prosocial actions and the power of mastery experiences in enacting individual inclinations toward behaviors. Accordingly, interpersonal self-efficacy beliefs might be considered flexible psychological structures that operate as proxy determinants of prosocial behavior by enabling individuals to turn their potential (e.g., traits as agreeableness) into effective prosocial behavior (Caprara et al. 2012).

The Promotion of Prosocial Behaviors in School Settings

During the last decades, school-based prevention efforts have been effective strategies to counteract trajectories of harmful behaviors across time and to promote adolescents' positive development (Greenberg 2010). Thanks to the contribution of the positive youth development (PYD) movement in the last 20 years, research on youth development has evolved into a vision focused on the strengths of adolescents and the plasticity of their development (Lerner et al. 2005). Moreover, prosocial behaviors seem to be based on a broad sense of social justice and equality (Yates and Youniss 1996) and prepare adolescents for active civic engagement, which is a crucial educational goal to meet the challenges of our globally connected world (Council of Europe 2010).

Currently, the social and emotional learning (SEL; Durlak et al. 2011; Greenberg et al. 2003) theoretical framework emphasizes the importance of building emotional and interpersonal capacities and developing prosocial behavior as a core element in school-based intervention programs. Among several SEL programs, however, the term *prosocial* is used in a broader perspective because it refers also to positive or competent social behavior. On the whole, these interventions have mostly focused on elementary school (e.g., *Incredible Years*, Hutchings et al. 2012) and addressed children from 6 to 12 years old (e.g., *Second Step*; Holsen et al. 2008). Evidence of efficacy in increasing prosocial *behavior* has been found mainly for elementary children, but not for adolescents, who report improvement in their prosocial *attitudes* (e.g., concern for others, desire to help; Battistich et al. 2000) rather than their behaviors.

Based on these theoretical premises, we designed a universal school-based intervention directed at adolescents in middle school. The CEPIDEA program is unique in that it is designed entirely to promote prosocial behaviors and not only general social skills. The school-based program proposed in the current study

does not conceive, as in other similar programs, the promotion of prosocial behaviors as only one component of the curriculum, but as the key factor permeating the entire proposal. That is, we combined key skills (including perspective taking and emotional regulation, for example), developing them gradually by specifically promoting prosocial actions. Another relevant characteristic of the CEPIDEA program is its focus on early adolescence—namely, an age at which children are more sensitive to relations with peers (January et al. 2011) and for which prosocial behavior may carry manifold beneficial effects. As indicated by a recent meta-analysis (January et al. 2011), early adolescents are more sensitive to interventions focused on positive peer relations. This plasticity could derive from the value they place on relationships with their classmates and from their need to manage new complex rules. Moreover, because previous findings suggest a kind of stability and even a decline of prosocial behavior in middle adolescence (e.g., Luengo Kanacri et al. 2013; Nantel-Vivier et al. 2009), interventions aimed to sustain behaviors that help others are favorable within this developmental phase.

Program Description

Five components were included in the CEPIDEA curriculum, four of them reflecting the most relevant personal determinants of prosocial behavior: (1) sensitization to prosocial values; (2) development of emotion regulation skills (management of negative emotions and expression and reinforcement of positive emotions); (3) development of empathy and perspective-taking skills; and (4) improvement of interpersonal-communication skills. The last component reflects a more collective sphere of prosocial behaviors: (5) the precursors of civic engagement. Related in different ways to these five components, the program adopted learning strategies for the promotion of interpersonal self-efficacy beliefs, such us persuasion, modeling, and mastery experiences (Bandura 1997), which are conducive to prosocial behaviors. Overall, the entire school was involved in the program, which included two kinds of intervention strategies: (1) *prosocial sessions* and (2) *prosocial lessons.* Prosocial sessions (16 in total) were delivered once a week during school hours by the project's research staff, in collaboration with teachers. Sessions included role playing, modeling, case analysis, interviews, and group discussions aimed at setting the conditions for experiencing and reflecting upon each component of the intervention. In addition to these workshops, teachers integrated the concepts of the curriculum through prosocial lessons (24 in total; 3-4 per classroom) delivered by teachers in various academic disciplines (e.g., Science, History, etc.) by pointing to the function (and the value) that behaving prosocially may provide in various contexts of life. On the whole, while prosocial sessions were crucial to promoting mastery experiences and applying new skills in daily school life, prosocial lessons were relevant to engaging students' reflections

regarding how prosocial values can be applied in their social contexts (e.g., family, neighborhood, etc.) and the benefits of prosocial behaviors across situations.

Given the central role that teachers play in their students' lives, an important strategy of CEPIDEA targets teacher training before intervention was implemented. Thus, teachers participating in the intervention attend seven training sessions (two hours per session) aimed at (a) sharing the intervention's theoretical background and goals; (b) learning to recognize and reinforce students' prosocial behaviors; (c) acquiring intervention procedures; and (d) promoting a collaborative classroom climate. Subsequently, all members of the research staff participate in monthly school council meetings to ensure both program implementation and fidelity. Research staff also meet with teachers individually and in small groups regularly to provide support and address potential concerns. The school principal was involved in each phase of the program implementation.

The Present Study

The present study aimed to evaluate the 18-month follow-up effects of the CEPIDEA intervention in comparison with a control group comprising participants belonging to a middle school different from the school in which the intervention was delivered. In addition, on the basis of a prior study (Caprara et al. 2014) in which the efficacy of CEPIDEA was evaluated considering the specific facets of the tendency to enact prosocial behaviors (i.e., helping and consoling), the current assessment focused on a broader measure of prosocial behavior given by helping, consoling, and sharing behaviors. The previous study was an exploratory examination of intervention effects on single dimensions of prosocial behavior. We reasoned that because representative aspects of prosocial behavior tap into a global "prosocial dimension" (Caprara et al. 2005), analyzing them as an overall behavioral tendency could add consistency to the efficacy of the CEPIDEA program. Furthermore, in line with the theoretical premises and aims, we also focused on evaluating possible changes in adolescents' interpersonal self-efficacy beliefs as important promoters of prosocial behavior. In viewing self-efficacy beliefs as knowledge structures able to drive and sustain prosocial behavior, we placed special emphasis on their effects in enabling children to build positive interpersonal relationships with their peers in the classroom context. In addition, we also evaluated the effects of the CEPIDEA program on participants' agreeableness because it can be conceived as the dispositional tendency that may predispose adolescents to behave prosocially (Caprara et al. 2012; Graziano and Eisenberg 1997). Although both interpersonal self-efficacy beliefs and agreeableness did not show changes in our first evaluation (Caprara et al. 2014), we did not exclude that these effects might have been decreased by the presence of contamination effects

due to a shared physical and social environment between intervention and control classrooms (i.e., the same middle school).[1]

In addition, we considered the decline in aggression as a relevant outcome one may expect from promoting prosocial behavior. As stated above, previous findings suggest that prosocial behavior may exert a positive role in mitigating the destructive consequences of aggression on adolescents' development (Kokko et al. 2006). Thus, we reasoned that extending children's behavioral repertoires, by including models and actions conducive to prosocial exchanges, could reduce the probability of engaging in aggressive behavior (e.g., Dodge et al. 2006). We intended both physical and verbal aggression as the most evident and dysfunctional markers of aggressiveness. We also expected that promoting prosocial behavior could result in an improvement of academic achievement in accordance with previous findings highlighting the long-term effect of prosociality on academic achievement (Caprara et al. 2000). Finally, in line with the prevention research and its implications for mental health interventions (Fairchild and Mackinnon 2009), we investigated the presence of moderation effects among participants in responding to CEPIDEA as well as possible mediation mechanisms through which CEPIDEA could have achieved its effects (i.e., the impact of prosocial behaviors on the reduction of aggressive behaviors; see Caprara et al. 2014). Overall, in pursuing the enhancement of prosocial behaviors in the classroom, CEPIDEA paid close attention to its impact on peer relationships using peer ratings to assess the changes in behavior (prosocial behavior and aggression) due to the intervention condition.

Method

Design

Thirteen seventh-grade classrooms (2009–2010 school year) from two middle schools participated in the present study. In particular, one school was assigned to the intervention condition and the other to the control condition. The assignment to the treatment condition was conducted at the school level (instead of the classroom level) to avoid undesirable "diffusion of treatment" effects (Cook and Campbell 1979). Both the intervention and the control groups were assessed sequentially at three different time points (i.e., pretest, posttest at 6 months, and follow-up at 18 months).

Participants

The study included 291 seventh graders enrolled in two middle schools in Genzano, a small city near Rome. Of note, these were the only two middle schools located in Genzano. The intervention group included

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[1] In the present study, we used a broader measure of interpersonal self-efficacy that is not strictly limited to the empathic self-efficacy beliefs evaluated in Caprara et al. (2014).

151 students (72 females) belonging to 7 classrooms, and the control group included 140 students (78 females) belonging to 6 classrooms. The mean age for students in the intervention group at pretest was 12.4 ($SD = .49$) and 12.6 ($SD = .53$) in the control group. The majority of the students of our sample were from intact families (91%), and only 7.6% were from single-parent homes (i.e., parents were separated or divorced) or had unmarried parents (1.4%). The families in Genzano represent a socioeconomic microcosm of the larger Italian society: 14% of parents were in the professional or managerial ranks; 25% were merchants or operators of other businesses; 31% were skilled workers; 29% were unskilled workers; and 1% was retired.

Procedure

The study was conducted over a 25-month period (from February 2009 to April 2011) and included assessments, teacher training, and classroom activities. First, CEPIDEA was presented to the school council and to the assembly of teachers to gain their approval. Parents were informed via both letters and an informational meeting and were asked to consent to their child's study participation. Parental informed consent was obtained for all the students at each assessment time point. Students who had the permission from their parents to participate in the study were on average 98.5% of the total number of the students for each classroom. In the intervention group, the first seven months (February–September 2009) were primarily devoted to creating a basis for the implementation of the intervention. Forty teachers (60% female) were invited, and most attended 7 training sessions (2 hours per session), to make them aware of the theoretical premises, goals, and procedures of the intervention. A total of 95% of teachers participated in these sessions, attesting to the teachers' engagement in the program. After identifying treatment classrooms, the members of the research staff worked with teachers using the curriculum materials and set the schedule of the intervention. A CEPIDEA coordinator teacher was appointed for each classroom participating in the intervention. Teachers who could not participate in the training sessions recovered them through specific meetings conducted by the research staff in order to ensure the adherence to the program. Subsequent to the final assessment, teachers of the control group participated in two meetings about the benefits of prosocial behavior and its role for youth's positive development. They also participated in two meetings of feedback about the results of their evaluation.

Questionnaires were administered in each classroom by two members of the research staff during school hours. The purpose and response choices of the questionnaires were explained to students, who were subsequently asked to complete the questionnaires independently of others. The procedure of assessment remained the same across the study. In October 2009, students from the intervention and control groups were assessed for the first time (pretest). Then the prosocial curriculum was implemented in the participants'

classrooms from the end of October 2009 to April 2010. At the end of the intervention, students were evaluated 6 months posttest (April 2010) and at the 18-month follow-up (April 2011). Finally, intervention fidelity was controlled by (a) manualization of prosocial sessions, (b) regular communication with teachers and their ongoing supervision, (c) weekly staff meetings, and (d) an *ad hoc* checklist[2] filled out by the staff at the end of each prosocial session that aimed to evaluate adherence to the programmed specifications.

Measures

Prosocial behavior. Prosocial behavior was assessed by using three peer-reported items (Caprara et al. 2000). Participants rated each classmate on three items intended to assess the frequency of occurrence of basic components of individual prosociality (i.e., consoling, helping, and sharing) through a 5-point response scale (from 1 = *never/almost never* to 5 = *often*; e.g., "How many times does ___ console others?"). Following standard procedures (e.g., Visconti and Troop-Gordon 2010), the prosocial behavior of each participant was assessed by averaging the three-item ratings of *at least* 20 classmates. In line with previous studies (Caprara et al. 2000; Youniss et al. 1999), the peer-rated prosocial behavior showed moderate-strong positive correlations with students' academic achievement (rs from .28 to .52, all ps <.01), thereby attesting to its validity. Reliability for the three-item scale was .94 at pretest, .90 at posttest, and .94 at follow-up.

Physical and verbal aggression. Participants rated each classmate on two items intended to assess the frequency of occurrence of physical ("How many times does ___ kick and punch others?") and verbal aggression ("How many times does ___ insult others?") by using a 5-point response scale (from 1 = *never/almost never* to 5 = *often*). As for prosocial behavior, an individual score of physical and verbal aggression was computed by averaging the evaluations of *at least* 20 classmates. Reliability for physical and verbal aggression was computed through test-retest correlation coefficients. Respectively, they were .82 and .86 (pretest/posttest), .75 and .75 (pretest/follow-up), and .79 and .81 (posttest/follow-up).

Interpersonal self-efficacy beliefs. Participants rated their interpersonal self-efficacy (from 1 = *not well at all* to 5 = *very well*) on 9 items assessing their perceived capability to constructively stay and

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[2] The checklist was a two-page assessment tool in which the following was reported: (a) the level of achieving the different specific aims of the session; (b) the level of students' involvement in the activities proposed; (c) strengths and criticisms observed in the implementation of the session; (d) specific responsibilities assumed by the members of the staff and the teacher; and (d) utility of timing and materials (see Luengo Kanacri et al. 2014a).

communicate in the class group, to sense another person's feelings, and to respond empathetically to another's

distress and misfortune (Di Giunta et al. 2010). Sample items include the following: "How well can you wait

your turn when you want to speak in classroom?" and "How well can you experience how a person in trouble

feels?" Cronbach's alphas were .73 at pretest, .78 at posttest, and .81 at follow-up.

Agreeableness. Participants rated their agreeableness on 6 items (1 = *almost never*; 5 = *almost always*)

in a condensed version of the Big-Five Questionnaire-Children (BFQ-C; Barbaranelli et al. 2003). The items

assessed children's sensitivity to others and their needs (e.g., "I treat my peers with love and warmth"). The

original BFQ-C was validated in Italy (Barbaranelli et al. 2008). Cronbach's alphas were .66, .76, and .75,

respectively, for pretest, posttest, and follow-up.

Academic achievement. Participants' achievement scores were collected at two time points: (1) at the

end of the sixth grade (before the beginning of any intervention assessment) and (2) at the end of eighth grade

(the end of middle school), based on original school records. In the Italian school system, teachers evaluate their

students by using a 10-level gradation for each subject (1 = *extremely insufficient* to 10 = *excellent*). We created

a composite measure of academic achievement from students' grades in their primary school subjects: Italian,

math, science, foreign language (English and French), and social studies.

Attrition. The retention rate was very high in our study, with approximately 98% of the participants

evaluated both at the posttest and at the follow-up. Overall, attrition analyses indicated that data at the 18-month

follow-up were not available for four subjects in the control group (2.86%) and for two subjects in the

intervention group (1.32%).

Data Analysis Approach and Model Evaluation

To examine the potential effects of the CEPIDEA intervention, we used a multiple-group latent curve

approach (MG-LC) as detailed by Muthén and Curran (1997). Latent curve models allow us to identify two

growth latent factors (i.e., the intercept and the slope) by using the means of the observed variables at each time

point (in our case, pretest, posttest at 6 months, and follow-up at 18 months from the pretest). In our study, the

intercept was centered at the first time point to represent the initial status of the growth by fixing all the intercept

factor loadings at 1 and the first slope factor loading at 0. The slope factor, on the other hand, represents the

mean-level change over time of the examined variables (Bollen and Curran 2006). Because the goal of any

intervention program is to alter the normative development of a specific behavior or pattern of behaviors

(Curran and Muthén 1999), the MG-LC approach is particularly useful as it allows us to capture the treatment

effects within the intervention group above and beyond the normative developmental trajectory of the targeted

behavior. Due to the complexity of the evaluation approach used, the following steps were required to appropriately estimate the intervention effects.[3]

Step 1: Estimation of the normative development in the control group. In this first step, an LC was estimated only within the control group to identify the normative developmental trajectory of the targeted behavior. In particular, for each of our constructs of interest, we tested three different models of change: (a) a *no-change model* that includes only the intercept latent factor (the mean and the variance of the slope are fixed to be zero) and assumes no change in the construct considered; (b) a *linear change model* in which the mean and the variance of the slope are freely estimated and a constant mean rate of change is supposed to occur among the participants (the slope factor loadings were fixed to be 0, 1, and 3 respectively for the pretest, posttest, and follow-up)[4]; and (c) a *nonlinear change model* in which the form of the change is not specified *a priori* by fixing at 0 and 1 only the first (pretest) and the last (follow-up) slope factor loadings while freely estimating the second (posttest) factor loading (see Bollen and Curran 2006 for a detailed discussion about the role of coding time in the LC models).[5] Then we identified the best-fitting model through the chi-square difference test for nested models ($\Delta\chi^2$).

Step 2: Estimation of the development in the intervention group. In this second step, the LC models previously estimated for each construct in the control group (i.e., *no change*, *linear change*, and *nonlinear change* models) were repeated within just the intervention group to assess whether a similar pattern of change could be appropriate for both groups.

Step 3: Multiple-group analysis. In this step, the LC model was estimated simultaneously both in the control and intervention groups. In detail, the normative growth factors previously estimated in the control group for a specific construct were also estimated in the intervention group. The parameters of the growth factors (means, variances, and covariances) were equated across the two groups, and the plausibility of these

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[3] The original model-building process indicated by Muthén and Curran (1997) included five steps, in which the last one is the *sensitivity analysis* (i.e., the evaluation of comparability of the intervention and control groups). In our evaluation approach, we performed the sensitivity analysis in Step 3.

[4] The one-unit increment of the first two factor loadings represented the 6-month interval between the pretest and the posttest, whereas the two-unit increment of the last factor loading represented the 12-month interval between the posttest and the follow-up.

[5] In order to allow the *nonlinear change model* to be overidentified, we tested the plausibility of constraining the residual variances of the observed variables to be equal over time.

constraints was assessed by the chi-square difference test ($\Delta\chi^2$) for nested models (*constrained model* versus *unconstrained model*). This comparison was defined as *sensitivity analysis* by Muthén and Curran (1997) and is particularly relevant as it allows us to ascertain if both groups were equal in their initial level as well as in their normative development over time. In addition, these equality constraints specified the amount of change in the intervention group that was attributable to the normative development (Curran and Muthén 1999). Of most importance, in our evaluation approach, a *second linear growth factor* was added only in the intervention group. This second linear growth factor represents any change in the intervention group that is not attributable to the normative development observed in the control group (see Figure 1). Thus, this procedure allowed us to separate the effect of the intervention condition from the normative developmental trajectory that existed without exposure to the intervention.

Step 4: Moderation effects. In this last step, the second linear change factor was regressed on the intercept and on the normative slope (if identified in Step 1) only within the intervention group. In this way, we could assess if the responsiveness to the intervention was affected by the initial status and/or the normative development of the participant.

All the MG-LC analyses were implemented in M*plus* 7 (Muthén and Muthén 2012) with maximum likelihood estimation of the parameters. Non-significant χ^2 likelihood ratio statistic, Comparative-fit-index (CFI), and Tucker-Lewis-fit-index (TLI) greater than .95 (Hu and Bentler 1999) and a root mean square error of approximation (RMSEA) value of less than .10 were considered indicators of acceptable model fit (Kline 2010). Full information maximum likelihood was used as the method of estimation of missing data. This method offers unbiased parameters under the assumption of missingness at random (MAR) by taking information from the observed data (Baraldi and Enders 2010).

Finally, to assess the intervention effect on academic achievement at the end of middle school (eighth grade) and because grades were available only at two waves (i.e., at the beginning and at the end of middle school), we implemented a hierarchical regression analysis in SPSS 18 while controlling for (a) previous academic achievement at the end of the first year of middle school and (b) gender.

Results

Descriptive Statistics

In Table 1, the descriptive statistics of the variables of interest were presented. We also checked the distribution of the variables, and none of them presented a problematic deviation from normal distributions. The

mean-level changes for both intervention and control groups were analyzed at the latent level and presented in the Latent Curve Analysis section.

Baseline Comparisons

The comparability of the two groups in terms of gender composition and socio-economic status (SES) was evaluated through chi-square analyses. The intervention and control groups were found to be equivalent in terms of gender composition χ^2 (N = 291, df = 1) = 1.877, p = .171 and SES by using father's and mother's educational level as a proxy indicator of SES (respectively, χ^2 (N = 259, df = 5) = 4.867, p = .432, and χ^2 (N = 262, df = 5) = 7.109, p = .213). As discussed in detail in the next section, the sensitivity analysis revealed that intervention and control groups did not differ in their initial levels of prosocial behavior, physical aggression, and interpersonal self-efficacy. The intervention group, instead, scored (a) significantly lower on the latent intercept of verbal aggression compared to the control group (Cohen's d = -.27), and (b) significantly higher on the latent intercept of agreeableness compared to the control group (d = .34).

Latent Curve Analysis

The intervention effects for each construct are reported according to the steps detailed in the previous section. Because we used latent variables, we computed an analogous Cohen's d measure of effect size (1988) for the main effects by using the difference in model-implied estimated mean for control and intervention groups divided by the standard deviation for the outcome at the last time point (Curran & Muthén 1999).

Prosocial behavior. As shown in Table 2, the normative developmental trajectory in the control group was characterized by a *nonlinear increase* over time of prosocial behavior (Step 1). Similarly, a *nonlinear increase* was also identified in the intervention group (Step 2). Therefore, both control and intervention conditions were characterized by a growth of prosocial behavior across the pretest assessment and the follow-up assessment. In order to evaluate whether the intervention condition had altered the normative increase of prosocial behavior, in Step 3 we estimated an MG-LC in which we added a third linear treatment factor only within the intervention group (see Table 3). The mean of the treatment factor was not statistically significant (see column $T_i M$), indicating a non-significant main effect of the intervention condition (d = .11). The variance of the treatment factor, on the other hand, was statistically significant, indicating the presence of meaningful differences in the effectiveness of the treatment across participants (see column $T_i Var$). In addition, the sensitivity analysis indicated that the intervention and the control groups were equal both in their initial status and normative increase of prosocial behavior (as attested by the non-significant value of the chi-square difference test between the constrained and the unconstrained model). Finally, Step 4 highlighted a statistically

significant *treatment-normative development* interaction. In detail, the significant negative effect on the normative slope by the treatment factor ($\beta = -.44$, $p < .05$) indicated that those participants in the intervention condition reporting a lower normative growth of prosocial behavior increased more quickly over time in their prosocial behavior ($R^2 = .19$). To examine more in depth this different sensitivity of the participants within the intervention group, we also regressed the treatment latent factor on the initial level of physical aggression. The effect from physical aggression at pretest of the treatment's latent factor was positive and statistically significant ($\beta = .25$, $p < .05$; $R^2 = .08$), revealing that those adolescents in the intervention group who were more physically aggressive (at the pretest) increased more in their prosocial behavior at the end of the intervention. These results held even when both moderated effects were estimated simultaneously (see Figure 2).

Physical aggression. The *linear change model* was the best-fitting model both for control and intervention groups (see Table 2). However, only the control group (Step 1) was characterized by a significant mean growth rate ($M = .04$, $p < .01$) with a significant variability ($s^2 = .01$, $p < .05$) over time. Indeed, the intervention group (Step 2) showed a negative mean change that was not statistically different from zero, but with a significant variability in the amount of change rate among individuals ($s^2 = .02$, $p < .01$). Therefore, the intervention condition, when analyzed separately from the control group, seemed characterized uniquely by a meaningful variability of the physical aggression change rate among participants. The MG-LC implemented in Step 3 provided clearer information about the intervention effect of the CEPIDEA program on this outcome (Table 3). The significant negative mean of the third linear growth factor ($M = -.05$, $p < .01$) estimated only within the intervention group indicated that the participation in CEPIDEA decelerated the normative increase ($M = .05$, $p < .01$) of physical aggression in the intervention condition ($d = -.33$). The sensitivity analysis (see Table 3) did not reveal any significant differences across groups in the initial status and in the normative development of physical aggression. Finally, Step 4 did not highlight any significant moderation effects.

Verbal aggression. A *nonlinear increase* in verbal aggression was the best-fitting model both for the control and intervention groups (Step 1 and Step 2; see Table 2). In Step 3, the MG-LC model did not indicate a statistically significant main effect of the intervention condition in reducing verbal aggression ($d = -.21$). The variance of the latent treatment slope, on the other hand, was statistically significant ($s^2 = .01$, $p < .01$), suggesting significant inter-individual differences in the response to CEPIDEA. However, the sensitivity analysis revealed that the two groups were not comparable in their initial levels of verbal aggression because the intervention group started with a lower level of verbal aggression than the control group (see Table 3). A more

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in-depth analysis in Step 4 did not reveal any moderating effects in terms of initial level and/or normative development of verbal aggression, or in terms of the initial level of the other variables of interest.

Interpersonal self-efficacy. As reported in the table (see Table 2), a *no-change model* and a *nonlinear change model* were the best-fitting models, respectively, for the control and the intervention groups when they were analyzed separately. Thus, the two groups were characterized by different trajectories of interpersonal self-efficacy. In particular, only the participants in the intervention group increased over time in their interpersonal self-efficacy beliefs. This increase was further confirmed in Step 3 of our evaluation approach when an MG-LC was implemented in both groups simultaneously (see Table 3). The significant positive mean ($M = .04$, $p < .05$) of the treatment factor reflected a meaningful treatment effect above and beyond the normative developmental stability of the control group ($d = .19$). The significant variance ($s^2 = .02$, $p < .01$) of the treatment factor indicated the existence of meaningful differences in the effectiveness of the treatment across participants (see Table 3). Importantly, the sensitivity analysis in the MG-LC framework revealed that intervention and control groups did not differ in their initial interpersonal self-efficacy statuses (i.e., the mean and the variance of intercept could be equated across groups). Finally, Step 4 did not indicate any moderating effect (no *treatment-initial status* interaction).

Agreeableness. The control group and the intervention group seemed to be characterized by two different trajectories (Step 1 and Step 2; see Table 2). Whereas the *no-change model* best fit the control group, the *linear change model* best represented the change in the intervention group. In the intervention group, only the variance of the latent slope was statistically significant ($s^2 = .04$, $p < .01$). Step 3 indicated that the mean of the treatment slope was not statistically significant. Only the variance of the treatment factor was statistically significant in the intervention group. Importantly, the sensitivity analysis indicated that the participants in the intervention group scored higher than their counterparts in agreeableness at the pretest (see Table 3). Therefore, the slightly higher agreeableness at the last time point ($d = .34$) in the intervention group compared to the control group should be interpreted with caution. Step 4 revealed a *treatment-initial status* interaction because the intercept significantly predicted the treatment factor ($\beta = -.38$, $p < .05$; $R^2 = .15$). This result indicated that those participants in the intervention group starting with a lower level of agreeableness tended to be more agreeable at the end of the CEPIDEA intervention.

Latent Growth Curve Mediational Models

In order to investigate the mechanisms through which the CEPIDEA program has exerted its influence on prosocial and aggressive behavior, we tested three plausible mediational models (see also Caprara et al.

2014). To test the mediated effect, we used the approach of a parallel process growth curve model with the factor of change (i.e., slope) as the putative mediator (Cheong et al. 2003). In the current study, the mediated effect was given by the effect of belonging to the intervention condition on the slope of mediator (e.g., prosocial behavior; path *a*) multiplied by the effect of the slope of mediator on the slope of the outcome (e.g., aggressive behavior; path *b*). This approach allowed us to examine the hypothesized mediated effects by relating the latent change factors of the constructs (e.g., if steeper increases in prosocial behavior from pre-test to follow-up conveyed the effect of the intervention on the decline of participants' aggressive behavior). To formally test the significance of the mediated effects (i.e., *ab*), we followed recent recommendations of Hayes and Scharkow (2013), and we used the bias-corrected bootstrap confidence interval method. The upper and lower limits of the 95% confidence interval (CI) of the indirect effect were calculated with 5,000 bootstraps. If the 95% lower and upper CI limits did not include zero, we concluded that the mediated effect was different from zero. In addition, in order to adjust for initial pretest scores, we regressed the slopes of the mediator (e.g., prosocial behavior) and the outcome (e.g., physical aggression) on the intercepts (Cheong et al. 2004). The general mediational approach used for the three models is graphically represented in Figure 3.

In the first model, we considered the slope of interpersonal self-efficacy as the putative mediator and the slope of prosocial behavior as outcome. This mediational model yielded a good fit ($\chi^2(12) = 15.36$, $p = .22$, CFI = .99, TLI = .99, RMSEA = .03), but the mediated effect was not statistically different from zero as the lower and upper confidence limits of the unstandardized mediated effect included zero (*ab* = .03; 95% CI = -.001, .221). In the last two models, we considered the slope of prosocial behavior as a putative mediator of the effect of the intervention condition on the slope of physical and verbal aggression (as outcomes). The mediational model with physical aggression as an outcome fit the data well ($\chi^2(11) = 15.42$, $p = .16$, CFI = 1.00, TLI = .99, RMSEA = .04), but the mediated effect was not statistically significant (*ab* = -.01; 95% CI = -.044, .002). The mediational model with verbal aggression as an outcome reported an acceptable fit ($\chi^2(9) = 28.87$, $p = .001$, CFI = .99, TLI = .97, RMSEA = .08), and the mediated effect was statistically significant (*ab* = -.07; 95% CI = -.245, -.001), highlighting the mediational role of prosocial behavior. The participation in the CEPIDEA program was associated with positive changes in prosocial behavior over time, which, in turn, counteract the growth of verbal aggression over time.

Academic Achievement

In the first step of the hierarchical regression analysis, a great amount of variance in later academic achievement ($R^2 = .72\%$) is explained by previous academic performance ($\beta = .836$, $p < .001$) and gender ($\beta =$

.072, $p = .027$), with females scoring higher than males. In the last step, treatment condition significantly

predicted ($\beta = .158$, $p < .001$) later academic achievement ($\Delta R^2 = .02$; $R^2 = .74$) above and beyond our control

variables, highlighting that the intervention group obtained higher grades than the control group at the end of

middle school.

Discussion

Schools should promote and strengthen positive social skills, habits, and values that allow students to

adjust well within the broader society. The current study aimed to assess the effect of an intervention conceived

entirely to endorse prosocial behaviors in middle schools, called CEPIDEA. A previous evaluation conducted at

a one-year follow-up with intervention and control classrooms taken from the same middle school reported

small-to-medium positive effects of the school-based CEPIDEA program in increasing helping behavior and

academic achievement as well as in decreasing physical and verbal aggression (see Caprara et al. 2014). The

present work represented an extension of the first assessment in which the effects of the CEPIDEA program

have been evaluated at a longer follow-up (i.e., 18-month follow-up) and with intervention and control groups

belonging to two different middle schools. Even if we recognize the quasi-experimental nature of the design of

the study, current results substantially confirmed our previous promising findings (Caprara et al. 2014) by

pointing out the effects of the CEPIDEA program on fostering prosocial behavior, interpersonal self-efficacy,

agreeableness tendencies, and academic achievement, while reducing physical aggression.

Overall, these effects suggest that interventions aimed at promoting positive developmental processes,

while having the potential to support positive outcomes, are also in the condition to counteract or redirect

negative trajectories of functioning (Schwartz et al. 2011). According to the PYD approach, these results

supported the relevance of enhancing positive values and habits of behavior for optimal youth adjustment and

highlighted how prosocial behaviors may have a compensatory additive effect as well as a protective effect in

reducing the risk of negative outcomes such as aggression (Kokko et al. 2006). In particular, regarding the

compensatory additive effect of prosocial behaviors, we found that the increase in prosocial behavior conveyed

indirectly the effect of CEPIDEA on decreasing verbally aggressive behaviors among participants. In line with

our previous evaluation (see Caprara et al. 2014), the specific direct effects of CEPIDEA on reducing verbal

aggression were not statistically significant. That effect was significant only when the adolescents' improvement

in their prosocial behaviors were considered as an explaining mechanism in linking the effect of the exposure to

the intervention on the reduction of adolescents' verbal aggression. However, although in our mediational

analyses we controlled for pretest differences, we recognized that the lower initial level of verbal aggression in

the intervention group compared to the control group might have played a role in affecting the difference in the trajectory of this outcome between the two groups. Accordingly, this result needs to be replicated in future implementations of the CEPIDEA program.

Regarding the eventual protective effect of prosocial behaviors, the results of our study highlighted that effects of CEPIDEA on adolescents' prosocial behaviors were statistically significant for those participants characterized by a lower normative development of prosocial behavior over time and with higher initial levels of physical aggression at the beginning of the intervention. Thus, our program, even if conceived as a universal intervention, seems to have a positive effect on those adolescents who lack adequate social skills. This is an encouraging result and might be explained by a sort of "peer modeling effect" in which the improvement in cooperation and supportiveness within classrooms may in turn create a natural positive behavioral regulation in the group. This reciprocal regulation, in turn, might benefit those who are less predisposed to help others and/or to manifest sharing or consoling behaviors in daily school life.

In addition, concerning our specific hypothesis about the direct impact of the CEPIDEA intervention on other relevant behavioral outcomes, the reduction of aggressive behavior was observed because the intervention group showed a small decrease in physical aggression compared to the control group. The MG-LC analyses showed a downturn in physical aggression in the intervention group above and beyond its normative developmental increase (as estimated in the control group). Although no significant direct effects of the CEPIDEA program were found for verbal aggression, it seems that this outcome was indirectly affected by the abovementioned compensatory additive role of prosocial behavior.

Moreover, we expected that the CEPIDEA program would have produced positive effects on interpersonal self-efficacy as a key personal determinant of prosocial behavior (Caprara et al. 2012). In effect, in alignment with SCT, the program was successful in changing those adolescents' judgments about their own capabilities to sustain positive interpersonal relationships—especially with peers. Thus, interpersonal efficacy beliefs appear as flexible knowledge structures capable of being affected by socialization practices and stimulating school environments. One may argue that the CEPIDEA program, by exposing adolescents gradually to mastering experiences, strengthened their own judgments about their capacities in showing empathetic feelings and developing communication skills (i.e., two main components of the program) and exerted a positive effect on their general beliefs of being capable of positive interpersonal relationships within the school context. Yet results from our mediational analysis failed to confirm the hypothesized mediational role of interpersonal self-efficacy as promoting prosocial behavior. This result could be partially explained by

considering the young age of the participants (i.e., early adolescence). Indeed, from a developmental

perspective, it is likely that adolescents might need (i) more time to develop appropriate self-evaluation

capacities to reflect on their own interpersonal skills as well as (ii) the cognitive ability to relate these skills to

their behavior. When adolescents reach a more coherent and integrated picture of their selves, it is likely that

their interpersonal self-beliefs might be more salient, thereby playing a major role in affecting their behavior.

Furthermore, the CEPIDEA intervention showed a small effect on participants' agreeableness. In detail,

we found that less initially agreeable participants increased more in their agreeableness at the end of the

intervention. This result suggests that stable individual characteristics, such as personality traits, might be

partially affected by appropriate educational actions. In our case, participation in CEPIDEA, with its strong

focus on promoting prosocial behavior, might sensitize less-agreeable adolescents to prosocial values, thereby

rooting these values in a deeper tendency toward being empathetic and prosocial, as represented by the

agreeableness trait. However, this result must be interpreted cautiously because the two groups were not

comparable in their initial levels (i.e., the intervention group started with a higher level of agreeableness), and

the assignment to the treatment condition was not randomized. Hence, we want to remark that only future

implementation of the CEPIDEA in randomized controlled trials (RCT) will offer clearer information about the

effects of the program on students' agreeableness.

Finally, adolescents targeted by the intervention obtained better grades at the end of middle school,

beyond the impressive stability of their previous academic grades. Even if the CEPIDEA program was not

designed directly for the enhancement of adolescents' learning skills, this result is in line with prior research

linking prosociality to academic achievement (Caprara et al. 2000; Wentzel 1993). Most of the implementation

criticisms raised by schools are anchored in the idea that interventions can reduce the time assigned to formal

learning. The positive effect of the CEPIDEA program on students' academic success suggests that moral and

academic behaviors should not be conceived as independent educational aims. The activities proposed by the

CEPIDEA curriculum were likely beneficial because they were introduced within various academic disciplines

and also through teaching styles. Even though we did not test the classroom climate as an outcome, we may

argue that it was also affected by the CEPIDEA program. Several studies indicated that a more positive

classroom climate, resulting from improved cooperation among students and between students and teachers, can

support a more regulated environment for learning that can, in turn, contribute to better grades (Jennings and

Greenberg 2009). Future studies should examine the specific mechanisms undergirding the effects of the

CEPIDEA program on students' academic achievement.

Importantly, to strengthen the robustness of our findings, we employed a sophisticated data analysis approach in which we evaluated CEPIDEA's effects above and beyond the normative developmental trend of the outcomes of interest. Specifically, the use of the MG-LC approach (Curran and Muthén 1999; Muthén and Curran 1997) permitted us to clearly distinguish effects based on the intervention (i.e., the latent treatment slope) from the development that a specific outcome might show in a normative condition (i.e., without exposure to the intervention). In this way, we avoided confounding the actual effect of the CEPIDEA program—such as on physical aggression—with its "natural change" over the specific time period considered (18 months). Due to the high social desirability of prosocial behavior (Crothers and Levinson 2004), another important strength of our study was the use of peer-rating measures, with at least 20 classmates evaluating each other's behaviors.

In spite of a number of strengths, we recognized several limitations that can undermine our findings. First of all, we adopted a quasi-experimental design. Therefore, we are aware that future implementations of CEPIDEA must use RCT to produce more reliable and valid causal explanations of the efficacy of our school-based program (Cook and Campbell 1979). Indeed, one cannot exclude that the effects of the CEPIDEA program on these outcomes are attributable to preexisting different developmental trajectories or to other phenomena, such as the regression toward the mean, or to a certain extent to a different level of teachers' involvement, in control and intervention groups. Future implementations of CEPIDEA should investigate to what extent the aforementioned promising findings are consistent across other different informants (parents, teachers, etc.). Additionally, although we used a sophisticated data analysis technique, future implementation of the program in larger samples might allow more advanced analyses such as multivariate LC models in which the effects of the CEPIDEA program on the outcomes of interest are estimated simultaneously.

Among other issues to be addressed by future studies, we want to stress the necessity to look at CEPIDEA's effectiveness. Hence, one should focus on the ecological validity of the program—the extent to which it might be extended across different real-world conditions. Further steps should lead to strategies designed to enable schools to adopt the intervention without such a substantial involvement of researchers.

Finally, we are aware that the effects of CEPIDEA can be considered as substantially small (Cohen 1988). However, a recent meta-analysis of SEL programs in school contexts found that a small effect size (around .20) was supported as acceptable for positive behaviors and conduct problems (Durlak et al. 2011). Thus, the magnitude of changes observed in the current study appear to be at the same level of those observed in school-based programs with similar theoretical approaches.

Conclusion

The school-based intervention CEPIDEA supports a theoretical integrative background applied in a "real" context and confirmed the positive effects of a program entirely designed for promoting prosocial behaviors, even at an 18-month follow-up. As scholars have claimed recently, to better understand adolescence, rather than artificial analysis, we need real-life integrative approaches (e.g., Amna 2012; Jennings 2001) with a focus on processes rather than outcomes (e.g., Luengo Kanacri et al. 2014b; McLeod & Shah 2009). The present study offers an actual verification of a *reciprocal movement* with theory informing reality and reality re-orientating a conceptual hypothesis regarding positive trajectories of adolescent development. Accordingly, throughout a curriculum gradually incorporated into routine educational practices, the major personal determinants of prosocial behavior during adolescence are addressed as vehicles of positive change. Primarily, a central focus was devoted to the improvement of related self-efficacy beliefs as malleable psychological structures that during adolescence may exert a crucial influence on the tendency to behave prosocially, especially among peers. In viewing adolescents as active agents of their own development, the positive effects of the CEPIDEA program in enhancing interpersonal self-efficacy beliefs are encouraging. In this line, current effects of the program stressed the importance of (a) utilizing a conceptual model for behavioral change in guiding interventions designed to promote prosociality during adolescence, and (b) ensuring that opportunities are provided for enabling adolescents' potential for prosocial responses to actually become behaviors.

From the current findings, we may principally assume that empathic peer connections among early adolescents are crucial in facilitating positive pathways (e.g., enhancing academic achievement) and in redirecting negative dispositions (i.e., counteracting aggressive conducts) over time and especially when prosocial adolescents are at risk of showing undesirable growth trajectories. Overall, the present contribution offers evidence about the importance of enrichment environments in encouraging positive behavioral patterns, particularly when adolescents' and youths' needs for safety, appropriate opportunities, and supportive networks of caring others are provided.

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Table 1

Descriptive Statistics

	Pre-test	*Post-test*	*Follow-up*
	M (SD)	M (SD)	M (SD)
PB			
Intervention	2.85 (0.56)	3.06 (0.52)	3.15 (0.51)
Control	2.86 (0.52)	3.00 (0.52)	3.09 (0.55)
PA			
Intervention	1.22 (0.31)	1.22 (0.23)	1.24 (0.27)
Control	1.36 (0.38)	1.46 (0.37)	1.56 (0.38)
VA			
Intervention	1.73 (0.63)	1.83 (0.61)	1.84 (0.58)
Control	1.88 (0.58)	1.95 (0.54)	1.95 (0.57)
ISE			
Intervention	3.49 (0.52)	3.61 (0.60)	3.62 (0.67)
Control	3.49 (0.52)	3.59 (0.55)	3.58 (0.55)
AG			
Intervention	3.46 (0.62)	3.38 (0.78)	3.55 (0.67)
Control	3.26 (0.58)	3.33 (0.58)	3.33 (0.73)

	Sixth grade	Eighth Grade
	M (SD)	*M (SD)*
Academic Achievement		
Intervention	7.16 (0.87)	7.54 (1.16)
Control	7.34 (1.07)	7.26 (1.26)

Note. Means and standard deviations (in parentheses). PB = Prosocial Behavior; PA = Physical Aggression; VA = Verbal Aggression; ISE = Interpersonal Self-Efficacy; AG = Agreeableness

Table 2

Fit Indices and Parameters Estimates (Step 1 and Step 2)

Step	Model	χ^2	df	CFI	TLI	RMSEA	MC	$\Delta\chi^2$	Δ df	I Mean	I Var	S Mean	S Var	I-S Cov
												Fit Indices / *LC Parameters*		
	1. no change	43.74**	6	.81	.90	.21	—	—	—	—	—	—	—	—
Step-1	2. linear change	6.71	3	.98	.98	.09	1 Vs. 2	37.03**	3	—	—	—	—	—
Control	**3. non-linear change**	**0.63**	**2**	**1.00**	**1.00**	**.00**	**2 Vs. 3**	**6.04***	**1**	**2.86****	**.19****	**.22****	**.06***	**-.01**
PB														
Step-2	4. no change [a]	111.28**	5	.67	.80	.38	—	—	—	—	—	—	—	—
Intervention	5. linear change [a]	26.91**	2	.92	.89	.29	4 Vs. 5	84.37**	3	—	—	—	—	—
	6. non-linear change [a]	**0.37**	**1**	**1.00**	**1.00**	**.00**	**5 Vs. 6**	**26.54****	**1**	**2.85****	**.26****	**.30****	**.07***	**-.06****
	7. no change	31.31**	6	.92	.96	.17	—	—	—	—	—	—	—	—
Step-1	**8. linear change**	**4.51**	**3**	**1.00**	**1.00**	**.06**	**7 Vs. 8**	**26.80****	**3**	**1.59****	**.24****	**.04****	**.01***	**-.01***
Control	9. non-linear change	3.01	2	1.00	1.00	.06	8 Vs. 9	1.50	1	—	—	—	—	—
PA														
Step-2	10. no change	15.84**	6	.97	.99	.10	—	—	—	—	—	—	—	—
Intervention	**11. linear change**	**3.84**	**3**	**1.00**	**1.00**	**.04**	**10 Vs. 11**	**12.00****	**3**	**1.50****	**.25****	**-.03**	**.01****	**-.02****

(continue)

	Model	χ²	df				Comparison	Δχ²	Δdf					
	12. non-linear change	3.42	2	1.00	1.00	.07	11 Vs. 12	0.42	1	—	—	—	—	—
	13. no change [b]	10.59	5	.98	.99	.09	—	—	—	—	—	—	—	—
Step-1	14. linear change [b]	3.77	2	.99	.99	.08	13 Vs. 14	6.82[†]	3	—	—	—	—	—
Control	**15. non-linear change[b]**	**0.23**	**1**	**1.00**	**1.00**	**.00**	**13 Vs. 15**	**10.36[*]**	**4**	**1.89****	**.25****	**.08***	**.03**	**-.02**
VA														
Step-2	16. no change	34.72**	6	.93	.96	.18	—	—	—	—	—	—	—	—
Intervention	17. linear change	12.49**	3	.98	.98	.15	16 Vs. 17	22.23**	3	—	—	—	—	—
	18. non-linear change	**3.40**	**2**	**1.00**	**1.00**	**.07**	**17 Vs. 18**	**9.09****	**1**	**1.74****	**.36****	**.11****	**.07****	**-.07****
	19. no change	**7.30**	**6**	**.99**	**.99**	**.04**	—	—	—	3.55**	.17**	—	—	—
Step-1	20. linear change	4.39	3	.99	.99	.06	19 Vs. 20	2.91	3	—	—	—	—	—
Control	21. non-linear change [c]	1.26	3	1.00	1.00	.00	20 Vs. 21	6.04	3	—	—	—	—	—
ISE														
Step -2	22. no change	23.03**	6	.80	.90	.14	—	—	—	—	—	—	—	—
Intervention	23. linear change	6.51	3	.96	.96	.09	22 Vs. 23	16.52**	3	—	—	—	—	—
	24. non-linear change	**2.65**	**2**	**.99**	**.99**	**.05**	**23 Vs. 24**	**3.86***	**1**	**3.50****	**.14****	**.14****	**.15***	**-.02**
Step -1	26. linear change	1.32	2	1.00	1.00	.00	25 Vs. 26	2.74	3	—	—	—	—	—
Control	27. non-linear change	0.46	1	1.00	1.00	.00	25 Vs. 27	3.06	4	—	—	—	—	—

(continue)

AG

							MC			I Mean	I Var	S Mean	S Var	I–S Cov
Step -2	28. no change	24.91**	5	.87	.91	.16	—	—	—	—	—	—	—	—
Intervention	**29. linear change**	**5.84***	**2**	**.98**	**.96**	**.11**	**28 Vs. 29**	**17.62***	**3**	**3.46***	**.38***	**.03**†	**.04***	**-.05***
	30. non-linear change	5.39*	1	.97	.92	.17	29 Vs. 30	0.41	1	—	—	—	—	—

Note. To ease the interpretation of the table, only parameters (unstandardized) of the best fitting models are reported. Best fitting models are highlighted in bold. PB = Prosocial Behavior; PA = Physical Aggression; VA = Verbal Aggression; ISE = Interpersonal Self-Efficacy; AG = Agreeableness. *df* = Degrees of Freedom; *MC* = Model Comparison; *I Mean* = Intercept Mean; *I Var* = Intercept Variance; *S Mean* = Slope Mean; *S Var* = Slope Variance; *I─S Cov* = Covariance between Intercept and Slope.

† *p* <.10; **p* <.05; ***p* <.01.

[a, b] According to the modification indices, we also estimated a residual significant covariance between the observed indicators at pre-test and post-test.

[c] In order to reach model identification we set to zero the non-significant (*p* >.05) covariance between intercept and slope.

Table 3

Fit Indices and Parameters Estimates (Step 3)

		Fit Indices						
		χ^2	*Df*	*CFI*	*TLI*	*RMSEA*	$\Delta\chi^2$	Δdf
	Constrained	**8.49**	**8**	**1.00**	**1.00**	**.02**	—	—
	Unconstrained	0.63	2	1.00	1.00	.00	7.86	6
PB [a]		MG-LC Parameters						
		I_n *M*	I_n *Var*	S_n *M*	S_n *Var*	I_n–S_n	T_i *M*	T_i *Var*
	Control	2.85**	.22**	0.23**	.04*	-.02†	—	—
	Intervention	2.85**	.22**	0.23**	.04*	-.02†	.02	.01**
		Fit Indices						
		χ^2	*Df*	*CFI*	*TLI*	*RMSEA*	$\Delta\chi^2$	Δdf
	Constrained	**11.21**	**10**	**1.00**	**1.00**	**.03**	—	—
	Unconstrained	8.52	7	1.00	1.00	.04	2.69	3
PA		MG-LC Parameters						
		I_n *M*	I_n *Var*	S_n *M*	S_n *Var*	I_n–S_n	T_i *M*	T_i *Var*
	Control	1.54**	.25**	.05**	.01*	-.02**	—	—
	Intervention	1.54**	.25**	.05**	.01*	-.02**	-.05**	.00

Fit Indices

		χ^2	Df	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf
	Constrained	**2.53**	**7**	**1.00**	**1.00**	**.00**	—	—
	Unconstrained	0.31	2	1.00	1.00	.00	2.22	5
VA [b]					*MG-LC Parameters*			
		$I_n M$	$I_n Var$	$S_n M$	$S_n Var$	$I_n\!-\!S_n$	$T_i M$	$T_i Var$
	Control	1.88**	.29**	.08*	.03*	-.03*	—	—
	Intervention	1.74**	.29**	.08*	.03*	-.03*	.01	.01**
					Fit Indices			
		χ^2	Df	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf
	Constrained	**15.83**	**13**	**.99**	**.99**	**.04**	—	—
	Unconstrained	14.46	11	.98	.99	.05	1.37	2
ISE					*MG-LC Parameters*			
		$I_n M$	$I_n Var$	$S_n M$	$S_n Var$	$I_n\!-\!S_n$	$T_i M$	$T_i Var$
	Control	3.54**	.15**	—	—	—	—	—
	Intervention	3.54**	.15**	—	—	—	.04*	.02**
					Fit Indices			
		χ^2	Df	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf
	Constrained	**12.03**	**8**	**.98**	**.99**	**.06**	—	—
	Unconstrained	11.39	7	.98	.99	.07	0.64	1

AG [c]		I_n M	I_n Var	S_n M	S_n Var	I_n—S_n	T_i M	T_i Var
					MG-LC Parameters			
	Control	3.30**	.22**	—	—	—	—	—
	Intervention	3.46**	.22**	—	—	—	.03	.01*

Note. Only parameters (unstandardized) of the best fitting models are reported. Best fitting models are highlighted in bold. ISE = Interpersonal self-efficacy beliefs; PB = Prosocial Behavior; PA = Physical Aggression; VA = Verbal Aggression; ISE = Interpersonal Self-Efficacy; AG = Agreeableness; *df* = Degrees of Freedom; I_n M = Normative Intercept Mean; I_n Var = Normative Intercept Variance; S_n M = Normative Slope Mean; S_n Var = Normative Slope Variance; I_n—S_n = Covariance between Normative Intercept and Normative Slope; T_i M = Intervention Slope Mean; T_i Var = Intervention Slope Variance.

*p <.05; **p <.01.

[a, b] In order to reach model identification, the residual variance of the observed indicator at the follow-up was fixed to be zero in the intervention group.

[c] According to the modification indices, we also estimated a residual significant covariance between the observed indicators at pre-test and post-test in the intervention group.
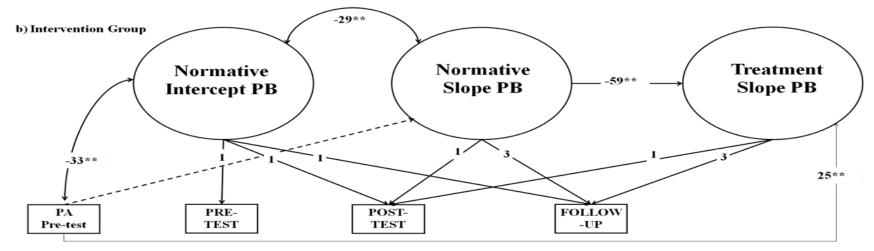
Figure 1.

General MG-LC Approach

Figure 2.

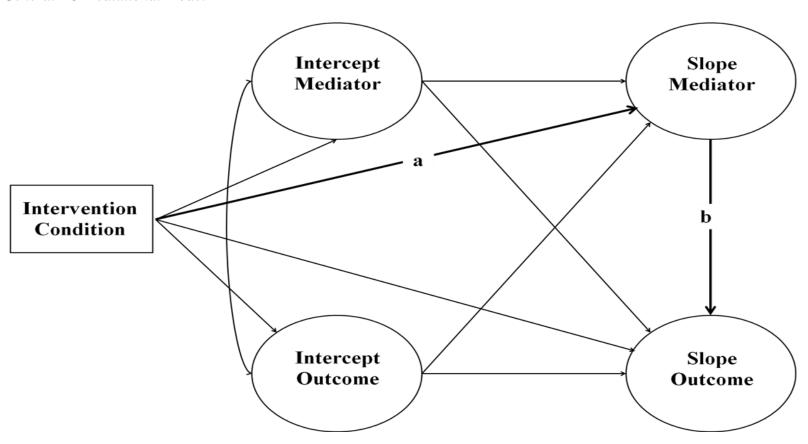*Moderation Effects for Prosocial Behavior (PB)*

Note. *p* <.05; **p* <.01.

Figure 3

General LC Mediational Model

Authors' contributions

GVC conceived of the study, participated in its design and drafted the manuscript; BPLK conceived of the study, coordination and drafted the manuscript, and interpretation of the data; AZ drafted the manuscript, participated in the design, and performed the statistical analysis; MG participated in the design of the study, drafted and corrected the manuscript; CP participated in the design of the study and helped to draft the manuscript. All authors read and approved the final manuscript.

Conflicts of Interest

The authors report no conflict of interests.