

Title

The Role of Ego Resiliency as Mediator of the Longitudinal Relationship between Family SES
and School Grades

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Abstract

Family socio-economic status (SES) represents one of the major determinants of youth's scholastic achievement, and thus it is important to unravel the psychological factors underlining this relation. In this article, we examined youth's ability to flexibly adapt and, thus, cope with harsh environmental conditions—assessed by the construct of ego-resiliency—as a mediating mechanism in the across-time association between family SES and academic achievement. The longitudinal sample was composed of 265 (56% females) Italian students who were about 13 years old at Time 1 (T1) and about 18 years old at Time 2 (T2). In a structural equation model analysis, family SES significantly predicted ego-resiliency six years later while controlling for the latter's strong longitudinal stability. Students' school grades at the end of senior high school were also predicted by ego-resiliency assessed at the age of 13, controlling for grades in the last year of junior high school, gender, and initial differences in ages. In accordance with the posited hypothesis, this study provided support for a two-wave mediational model in which the relation between family SES at 13 years and later school grades at 19 years was mediated by ego-resiliency. All in all, results support the argument that being resilient, and thus being able to flexibly adapt one's own emotional state and resultant behavior, matters to school success.

Keywords: SES, ego-resiliency, academic achievement, school grades.

Introduction

Academic success is viewed as an important component for optimal adolescent development because it represents a major indicator of psychological adjustment (McLeod, Uemura, & Rohrman, 2012) and long-term achievement. Academic difficulties are an early predictor of long-term risk for school drop-out, academic failure, and eventually problems achieving a successful career in adulthood (Alexander, Entwisle, & Kabbani, 2001). Thus, the considerable attention devoted to this topic by psychologists and educators it is not at all surprising (see Crystal et al., 1994; Salmela-Aro & Tynkkynen, 2010).

Among the contextual variables affecting school success, socioeconomic status (SES), measured as a combination of education, income, and/or occupation, has been consistently related to academic achievement (Sirin, 2005). Research indicates that youth from families characterized by a low socio-economic background tend to develop academic skills more slowly compared to youth from a more affluent familial environment (Morgan, Farkas, Hillemeier, & Maczuga, 2009). The economic (e.g., low income), social (e.g., living in disadvantaged neighborhoods), and psychological (e.g., higher level of chronic stress, parental depression, etc.) difficulties experienced by low SES families are believed to negatively affect the quality of the home environment, thereby undermining children's and adolescents' academic life (Eamon, 2005).

Interestingly, although the positive link between SES and academic success has been corroborated in several empirical studies (see Sirin, 2005), the specific mechanisms through which SES could exert its influence on students' academic performance are still a matter of debate and deserve further investigation (Reardon, 2011). As reviewed by Brooks-Gunn and Duncan (1997), children living in poor socio-economic conditions are more likely to experience

several negative outcomes that can jointly deteriorate their academic performance, such as cognitive and socio-emotional delays, low parental mental health, higher levels of stress, etc. Accordingly, identifying the possible pathways through which SES operates can inform efforts to develop more specific intervention strategies for promoting children's success at school. In the present study, we sought to partly address this gap by examining the role of ego-resiliency, defined by Letzring, Block, & Funder (2005, 396) as the "dynamic capacity to contextually modify one's level of control in response to situational demands and affordances," as a possible psychological variable mediating the relation of SES to academic achievement during adolescence. Specifically, we hypothesized that impoverished home environments characterized by persistent economic difficulties and poor parental involvement compromise adolescents' opportunities to develop appropriate self-regulatory and flexible, adaptive coping skills, which contribute to ego-resiliency, and, in turn, undermine their capacity to succeed in increasingly demanding academic settings.

The flexibility inherent in ego-resiliency may be particularly important during transitions when youth must adapt to changes in their environment and social expectations. Moving from junior to senior high school, for example, represents one of the major transitions faced in adolescence. Entering high school requires learning a new set of rules and values, acquiring a new social role, and, most of all, learning new and often challenging subjects. In this process, ego-resiliency, which provides youth with a positive reservoir of emotional adaptability and flexibility, is expected to play a pivotal role. For example, higher levels of ego-resiliency allow youth to be persistent in the face of frustration (Funder & Block, 1989), such as when they experience a lower test score or grade than desired or expected. Moreover, youth higher in ego-resiliency are theoretically better able to manage academic stress due to their higher emotional

self-regulatory abilities. Finally, by having a naturally higher tolerance to perceived frustration and a higher ability to delay gratification (Funder & Block, 1989), they have more resources to invest in the often frustrating process of learning challenging school subjects.

In this study, based on the aforementioned considerations, we examined the mediational role of ego-resiliency in a sample of Italian adolescents followed during the transition from early to late adolescence (i.e., from 13 to 19 years of age), a developmental phase characterized by important academic challenges such as the transition from lower secondary school (junior high school) to upper secondary school (senior high school). The use of a relatively large sample and of a stringent longitudinal design allowed us to improve the quality of the inferences we could derive from our data. Below, we present in greater detail the theoretical rationale underlying the aforementioned theoretical model.

Although several definitions and operationalizations of family SES can be found in the literature, family SES generally has been conceptualized as the levels of education, occupational attainment, and income of the adult members belonging to the same family group (Johnson, McGue, & Iacono, 2007; Sirin, 2005). From a theoretical perspective, many factors associated with low SES could be responsible for the lower academic performance of children living in disadvantaged families. For instance, the lack of adequate economic conditions can impede access to both basic (e.g., housing, food, etc.) and educational (e.g., books, inability to pay school fees, etc.) resources important for adolescents' well-being and academic life. Additionally, adults in low SES families could experience difficulties in balancing family and work life (because they are often required to be employed in two or more part-time jobs) which increases the risk of stress and family conflict and diminishes the quality of parenting (Conger, Conger, & Martin, 2010; Conger & Donnellan, 2007), three harmful factors for students' academic success

(Eamon, 2005; Sirin, 2005). Although affluent families can also be characterized by a stressful home environment (e.g., high pressure and expectations, physical and emotional isolation, etc.; see Luthar & Latendresse, 2005) that might lead to serious detrimental consequences for children's emotional and behavioral health, living in a low SES family seems to be a specific risk factor for academic failure (Reardon, 2011). In sum, stress at home, economic restrictions, and difficulties in time-management are likely to be jointly responsible for the poorer academic performance of students from a low SES background (Reardon, 2011), in part through their effects on an array of mediating variables.

In the first meta-analysis on the relation between SES and academic achievement, White (1982) found that the correlation between SES and academic achievement was small-to-moderate (around .22) at the individual level whereas it was much larger (around .73) when computed at the aggregated level (i.e., school or communities as unit of analysis). Sirin (2005), in a follow-up meta-analytic review of 58 published articles from 1990 to 2000, reported similar results. Interestingly, Sirin (2005) found that students' grade level significantly moderated the relation between SES and academic achievement: Students from middle school ($ES = .31$) and high school ($ES = .26$) showed a stronger effect size (ES) for the relation between SES and academic achievement than did kindergarten students ($ES = .19$), thereby suggesting an increasing or stable trend "across various levels of schooling" (Sirin, 2005, p. 440).

The importance of SES as a contextual predictor of academic achievement has also been confirmed in more stringent analyses investigating its pure environmental effect while partialling out confounding genetic influences (i.e., due to most students from low SES living with their biological parents), parental academic aspirations, IQ, school engagement, etc. (Johnson et al., 2007; also see the review by Duncan, Magnuson, & Votruba-Drzal, 2015). Interestingly, a

relatively recent sociological analysis (Reardon, 2011) indicated that the academic achievement gap of children from high SES and low SES families (considered in terms of income) has increased over the last 40 years (approximately +30%), thereby further supporting the positive role currently played by economically secure family environments in sustaining children's and adolescents' cognitive development and academic success.

Ego-resiliency and Academic Achievement

Ego-resiliency is an important personality characteristic that provides individuals with the necessary resources (emotional, motivational, cognitive, etc.) to self-regulate their behaviors and successfully adapt to changing circumstances (Letziring, Block, & Funder, 2005). Although the trait of ego-resiliency is closely related to self-regulatory temperamental variables (e.g., effortful control; Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Eisenberg et al. 2004), the presence of unique properties such as the high flexibility and perseverance in the face of adversity clearly differentiate the construct of ego-resiliency from similar self-regulatory personality/temperamental dimensions.

From a conceptual point of view, the high levels of adaptation and flexibility of ego-resilient individuals are likely to play a substantial role in sustaining their performance in academic settings (Kwok, Hughes, & Luo, 2007). First, a correlation between ego-resiliency and academic achievement is expected in light of the often-reported correlation between measures of ego-resiliency and intelligence (see Block & Kremen, 1996). As argued by Block (Block & Kremen, 1996, 351), ego-resiliency correlates with measures of intelligence because “adaptability is at least a partial indicator of a sufficient functioning of underlying intellectual components, such as short-term memory, information, reaction time, et cetera.” Thus, youth higher in ego-resiliency can naturally be expected to be higher in IQ, and consequently to obtain

better academic grades. In addition, ego-resilient students, in comparison to less ego-resilient peers, could be expected to easily adapt to unexpected changes/events in their daily school life (i.e., change of teachers/classrooms, new classmates, etc.), perceive difficulties as challenges, flexibly use problem-solving strategies, initiate/join supportive learning environments, and persevere in their effort to meet school requirements (Bursik & Martin, 2006; Liew, McTigue, Barrois, & Hughes, 2009; Kwok et al., 2007).

In a longitudinal study conducted with 445 first graders, Kwok et al. (2007) found that students' resilient personality was associated with higher grades both concurrently and one year later while controlling for IQ and externalizing problems. Similarly, in a longitudinal study with 784 first graders, Dreke (2009) found ego-resiliency predicted math scores (but not on reading achievement scores) two years later. Importantly, empirical evidence also indicates that the relation of ego-resiliency to academic success is not limited to childhood but also extends to adolescence, a developmental period in which students routinely face increasingly challenging school demands. Using a cross-sectional sample of 240 Mexican American early adolescents, Swanson, Valiente, Lemery-Chalfant, and O'Brien (2010) found that ego-resiliency significantly mediated the relation of supportive parenting to academic achievement. In a study conducted with 142 middle adolescents, Bursik and Martin (2006) reported similar results with ego-resilient characteristics concurrently related to better academic performance while controlling for other important variables such as verbal intelligence and students' learning orientation.

Family SES and Ego-resiliency

One important tenet of our theoretical model is that the individual's level of emotional and regulatory flexibility likely depends, in part, upon the levels of parents' cultural and professional capital, conceptualized, respectively, as parents' maximum educational degree and

the prestige of their type of work. As argued by Eisenberg, Cumberland, and Spinrad (1998), environmental factors that vary across families, neighborhoods, and communities (e.g., stress) and SES affect familial interactions and youth's social and emotional functioning. In this regard, Sheffield-Morris, Silk, Steinberg, Myers, and Robinson (2007) proposed that family SES influences youth's emotional adjustment via three major mechanisms: (1) youth's observation of parents' emotional status, (2) parenting practices and behaviors related to the socialization of emotion, and emotional climate of the family, as reflected in the quality of the attachment relationship, and (3) styles of parenting, family expressiveness, and the emotional quality of the marital relationship (see Sheffield-Morris et al., 2007). Moreover, parents with greater resources are likely to have more to offer in terms of guidance, nurturance, and practical help (Conger et al., 2010; Conger & Donnellan, 2007; Fingerman et al., 2009). It is thus likely that family SES is predictive of high levels of ego-resiliency throughout the transition from junior high school to the end of high school, a period that also signals the transition from late adolescence to emerging adulthood.

Investigators have demonstrated that family SES is related to and predicts youth's emotional development and functioning (see Bradley & Corwyn, 2002). For example, low family SES has been associated with less adaptive functioning and a higher likelihood of developing depression and delinquent-related problem behaviors in adolescence (McLoyd, 1997; Ortega & Corzine, 1990). In a quasi-experimental study, Costello, Compton, Keeler, and Angold (2003) observed that increases in family income were associated with decreases in behavioral problems for children. It is likely that parents with high education and resources, compared to disadvantaged parents, are better able to invest in the development of their children's human, social, and cultural capital. Accordingly, Lareau (2003) reported a higher concerted effort to take

care of children's needs for adults with class-advantaged than disadvantaged backgrounds (Semyonov & Lewin-Epstein, 2001; White, 1982).

Accordingly, we hypothesized parental SES might affect the development of ego-resiliency because an impoverished environment can undermine the cognitive, social, and emotional resources needed to foster positive psychological development (Kerckhoff, 1995; Sewell & Hauser, 1980). Block and Block (1980) found that resilient children were likely to come from families composed of parents who were able to take care of their children's needs, and to offer them a nurturing, warm family climate. Family SES could be especially important at this point in time, considering how recent structural and cultural changes have resulted in an extension of the period in which youth depend upon their parents (Furstenberg, Kennedy, McLoyd, Rumbaut, & Settersten, 2004). In most industrial or western cultures, and for many families, active parenting extends beyond adolescence. Consistent with the argument that SES predicts ego-resiliency, ego-resiliency has been found to mediate the relation between parenting practices and social competence or internalizing problems (Eisenberg, Chang, Ma, & Huang, 2009; Hofer et al., 2010). Moreover, from a theoretical stance, the quality of the global family environment is expected, in combination with genetic factors, to predict observed levels of ego-resiliency (Block & Block, 1980). Genes are expected to determine the average set point for ego-resiliency and the potential of an individual in regard to their level of ego-resiliency. Harsh family environment, instead, may determine the average deviation from the above set point observed for a specific individual at a specific point in time and whether individuals achieve their potential.

The Present Study

Drawing upon previous theoretical reasoning, we investigated the role of ego-resiliency

in mediating the relation of family SES to academic achievement in a longitudinal sample of Italian adolescents followed from age 13 to 19. We focused on this adolescent period because (a) the transition from lower secondary school (junior high school) to upper secondary school (senior high school) represents a crucial phase in the Italian school context at which students individually choose their academic path for the first time (Zuffianò et al., 2013), and (b) school demands become increasingly challenging and thereby require increasingly sophisticated abilities and resources (emotional, motivational, cognitive, etc.), and possibly flexibility, to cope with them. We did not exclude the possibility that, over time, school grades contribute to ego-resiliency. Indeed, the pursuit of school success might require people to exert their self-regulatory abilities in a flexible manner because engagement in relevant school tasks (e.g., maintaining concentration on learning despite sub-optimal circumstances, doing daily homework when stressed or tired, choosing how and when it is most adaptive to direct attention to do well in school, etc.) poses demands on individuals in terms of modulating and maximizing self-regulatory capabilities. In the long run, the daily tasks and behaviors required for most individuals to do well in school may strengthen students' ability for flexible self-regulation, and self-regulation predicts ego-resiliency (Eisenberg, Spinrad, & Morris, 2002).

Based on existing cross-sectional (e.g., Swanson et al., 2010) and longitudinal findings (e.g., Kwok et al., 2007), we hypothesized that higher family SES sets the contextual basis for the development of adolescents' ego-resiliency that, in turn, predicts superior academic performance six years later. In order to better assess the mediational role of ego-resiliency, we used a stringent two-wave autoregressive cross-lagged model that allowed us to estimate the mediational paths of interest while controlling for the stability of our variables over time (Cole & Maxwell, 2003). Finally, we investigated in an exploratory manner the comparability of the

hypothesized mediational model for males and females, given previous studies suggesting the existence of potential gender differences in the developmental trajectory of ego-resiliency in adolescence (Chuang, Lamb, & Hwang, 2006).

It is important to emphasize that our model was focused on the prospective relations among variables. Our hypothesis was that the process linking family SES to higher academic achievement via ego-resiliency unfolds over time, and was based on the expectation that youth living in families characterized by a higher level of socio-economic resources receive higher levels of guidance, emotional nurturance, and practical help. The higher support received by those youth was expected to lead to a better emotional adjustment, and, indirectly, to higher academic achievement. Thus, our model placed far less emphasis on the cross-sectional relations between those constructs because (1) we assumed that the above hypothesized relations need time to unravel, and (2) it is possible that children from affluent families exhibit emotional or school problems from time to time, but, in the long run, are better adjusted emotionally and more successful at school. In any case, we controlled for the within-time association of family SES with ego-resiliency and academic achievement to correctly estimate the longitudinal cross-lagged associations between variables (Cole & Maxwell, 2003), while not making any specific hypothesis about their significance.

Finally, in all models we controlled for sex and age because differences in these variables could easily result in bias in the estimates of the theoretical parameters of interest. Sex was a significant correlate of academic achievement in a recent meta-analysis (Voyer & Voyer, 2014), and researchers sometimes have reported gender differences in ego-resiliency (with females scoring higher than males, see Milioni et al., 2014). Age was controlled to minimize the

possible effect of age differences (albeit they were small) between participants within each wave, which could affect academic performance.

Method

Participants and Procedure

The participants were 265 children, 149 boys and 116 girls, part of an ongoing longitudinal project that started in 1987 with primary goal of investigating the personal and social determinants of children's and adolescents' adjustment. This longitudinal project includes a staggered, multiple cohort design, with different cohorts assessed at different time points.

The participating children were originally drawn from two junior high schools in Genzano, a residential community located near Rome. Children were re-assessed every other year until the end of senior high school and were assessed less frequently thereafter. A school council composed of parent and teacher representatives at the junior high school level approved the research. In addition to parents' consent, children were free to decline participation.

The current study includes two cohorts composed of students belonging to both schools assessed at four different time points, staggered by two years. These cohorts were aged approximately 13.26 ($SD = .51$; min = 13, max = 15) years at Time 1 (T1: 8th grade), and 18.11 ($SD = .49$, min = 17, max = 19) at Time 2 (T2: 13th/end of senior high school). With regard to fathers' level of education, about 15% had an elementary school degree, 39% had a junior high-school degree, 37% a senior high-school degree, and the remaining 9% earned a university degree. For mothers, the analogous percentages were about 16%, 39%, 39%, and 6%. With regard to fathers' profession, 15% were in professional or managerial ranks, 24% were merchants or operators of other businesses, 30% were skilled workers, 30% were unskilled workers, and 1% were retired. Analogous percentages for mothers were 5%, 19%, 31%, 33%,

and 1%, and 11% were housewives. In general, the occupational socioeconomic distribution of families at the beginning of the study matched the national profile when the study was conducted (ISTAT, 2002).

At T1 and T2, data were collected in the children's classrooms by two female experimenters. At T2, the adolescents were contacted by phone and invited to participate in the study for which they received a small payment.

Attrition

The participation rate was about 71% across both time points ($N = 190$). We found no statistically significant differences regarding T1 school grades, or any significant differences in the proportion of males and females, between the participants who had data at both assessments for the present study and those who were missing data at T2. Among the missing participants, 31 adolescents (11.6%) dropped out of the school after the end of junior high school. The participants who did drop out of school were enrolled in classical and scientific lyceums (50.1%), technical schools (29.9%), and professional schools (20.0%). Adolescents who dropped out of the school (and thus were not available at T2) had lower socio-economic status ($r = -.16, p < .031$; Cohen's $d = -.32$) and lower ego-resiliency ($r = -.22, p < .001$; Cohen's $d = -.45$) at T1. The sample matched national data for both socioeconomic characteristics and composition of the families (Istituto Italiano di Statistica, 2002).

Measures

All available participants were assessed at two waves of data collection during the course of the longitudinal study. Ego-resiliency and academic achievement were assessed in two critical periods of school career: (1) T1, at the end of the junior high school (8th grade), which marked the end of compulsory education; (2) at T1 (13th grade), the last school year before entrance to

university.

Family socio-economic status. Family SES was based on the occupation and education of the fathers and the mothers as reported by students at T1 and verified by the researchers with parents (see Sirin, 2005). We performed a confirmatory factor model, with SES specified as a formative construct (see Bollen & Lennox, 1991) with loadings from four indicators: (1) father's education, (2) mother's education, (3) father's occupation, (4) mother's occupation. We used weighted least square estimators with robust standard errors and the mean and variance adjusted chi-squared test statistics (WLSMV) as the method of estimation (see Muthén, 1998-2012). This method is particularly suited for dealing with non-normal or categorical data (Flora & Curran, 2004). After establishing the mono-dimensionality of this set of indicators (52% of variance explained), we estimated the factor score of SES. This variable was included as proxy of family SES in all subsequent analyses

Ego-resiliency. To assess ego-resiliency, we used the 10-item ER89-R (Alessandri, Vecchio, Steca, Caprara, & Caprara, 2007; Vecchione, Alessandri, Barbaranelli, & Gerbino, 2010). Participants were asked to indicate on a seven point scale (from 1 = does not apply at all to 7 = applies very strongly) the degree to which they agreed with each statement. Samples items are, "I get over my anger at someone reasonably quickly," "I quickly get over and recover from being startled," and "I usually think carefully about something before acting" ($\alpha = .82, .83$, at T1 and at T2, respectively).

Academic achievement. At the end of junior high school (8th grade), six different teachers separately graded all the children in their classes for academic achievement. The grading system of the Italian middle school (as well as primary school) at the time of our study, was based on systematic teacher evaluations of student learning using oral and written classwork

and homework, as well as attitudes and behavior. At the end of the school year, all classroom teachers (i.e., those teaching different subjects) provided an evaluation for each student for the particular subject taught in the teacher's class using an overall mark of "excellent," "very good," "good," or "adequate/sufficient" or "not adequate/ not sufficient." The mark on each subject had to be approved by the Class Council composed by all teachers of the class. The subjects areas were mathematics, science, language, and social studies. The separate multiple grading of academic performance across a variety of academic subjects reduces the likelihood of any systematic teacher bias (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000). The grades were averaged as a composite measure of academic achievement (average correlation between evaluations = .68 ($SD = .06$). This measure of academic achievement corresponds to the National Education Evaluation format used throughout Italy. The grades were averaged as a composite measure of academic achievement (average correlation between evaluations: .68 ($SD = .06$).

Grades on the same school subjects were collected again at the end of senior high school (8th/13th grade). We created a composite measure of academic achievement by averaging the grades obtained by students in mathematics, science, language, and social studies. The validity of this measure of has been confirmed in previous studies (see Caprara, 2008, 2010).

Results

Descriptive Statistics

Means, standard deviations, and Pearson correlations of SES, sex, age, ego-resiliency and school grades are reported in Table1. Statistically significant and moderately sized correlations across time support the considerable stability of both ego-resiliency and academic grades. Family SES was significantly, positively correlated to ego-resiliency (at T2) and to junior and high

school grades (at both T1 and T2). Self-ratings of ego-resiliency at T2 were significantly, positively related to high school grades (T2). In regard to control variables, only sex was significantly related to ego-resiliency at T2 (males: $M = 4.87$, $DS = .79$, females: $M = 4.91$, $DS = .73$; Cohen's $d = -.04$), for both junior (males: $M = 6.35$, $DS = 1.03$, females: $M = 6.67$, $DS = 1.18$; Cohen's $d = -.28$) and high school (males: $M = 6.77$, $DS = 1.02$, females: $M = 7.23$, $DS = .98$; Cohen's $d = -.46$) students. In all cases, females scored higher than males.

Modeling Strategies

We tested our theoretical model using a two-wave mediational design, following the suggestions of Cole and Maxwell (2003; Maxwell & Cole, 2007). In particular, we estimated a model that included (a) all the autoregressive paths (i.e., the paths predicting a variable from its prior level), as well as the across-time paths from (b) SES at T1 to ego-resiliency and school grades at T2, (c) ego-resiliency at T1 to school grades at T2, (c) school grades at T1 to ego-resiliency at T2, and (d) all direct paths from each covariate (i.e., sex and age) to all variables included in the model. In addition, all variables were allowed to covary within time.

The above model specification allowed us to test longitudinal mediations as follows. The hypothesized influence of family SES on ego-resiliency was represented by the across-time, cross-lagged paths from T1 family SES to T2 ego-resiliency. According to Cole and Maxwell (2003; but see also MacKinnon, 2008), this link represents an analogue of the path usually labelled as “path a” in cross-sectional mediational models, linking the predictor to the mediator. Likewise, the path from T1 ego-resiliency to T2 high school grades represented the hypothesized flow of influence linking these two constructs across time in the mediational chain. This path represents the path “b,” in mediational analyses, linking the mediator to the outcome in cross-sectional models (Cole & Maxwell, 2003; MacKinnon, 2008). The product between the

coefficients associated between the above pairs of cross-time, cross-lagged paths (i.e., the product: “path a* path b”) provides an estimate of the partial regression coefficient associated with the mediated effect, or the longitudinal indirect effect of family SES on high school grades through ego-resiliency (see Cole & Maxwell, 2003).

Structural Equation Analysis

To estimate the hypothesized model, we used Mplus 7.11 (Muthén & Muthén, 1998/2012). Missing data were handled by using full-information-maximum-likelihood (FIML) estimation of the parameters. This method offers unbiased estimates under the assumption of ignorable missing data pattern such as missing at random (MAR) or missing completely at random (MCAR). According to a multifaceted approach to the assessment of model fit (Tanaka, 1993), the following criteria were employed to evaluate the goodness of tested models: chi-square likelihood ratio statistic, Tucker and Lewis Index (TLI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) with associated 90% confidence intervals. The significance value of chi-square is sensitive to large sample sizes and easily produces a statistically significant result (Kline, 2015). We accepted TLI and CFI values greater than .95 (Hu & Bentler, 1999) and RMSEA values lower than .06 (Browne & Cudeck, 1993) as thresholds for good fit to the data. In order to deal with measurement error, adolescents' scores on ego-resiliency were included in the model as single indicator latent variables by estimating the error terms from the reliability of the measure (Kline, 2015). In testing mediation, we followed MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), who recommended the asymmetric confidence interval method to formally test the significance of longitudinal indirect effects (Mackinnon, Lockwood, & Williams, 2004). The critical values for the upper and lower confidence limits for indirect effects were tested by using the Monte Carlo Method for Assessing

Mediation CI method (Hayes & Scharkow, 2013) with 20,000 replications.

Longitudinal Modeling

The hypothesized model, displayed in Figure 1, showed a good fit to the data: $\chi^2(2) = 0.41$, $p = .82$, CFI = 1.00, TLI = 1.06, RMSEA = .00 (90% CI: .001, .073). As can be observed, all autoregressive paths were significant, demonstrating a moderately high degree of stability over time. As hypothesized, family SES significantly predicted ego-resiliency across time. In turn, T1 ego-resiliency significantly predicted high school grades at T2, mediating the effect of SES on high school grades over time. This effect of SES on high school grades through ego-resiliency was significant, .02 (.001, .081), supporting the pivotal role of ego-resiliency in mediating the effect of SES on high school grades over time. Grades at T1 did not predict ego-resiliency at T2. In regard to covariates, sex significantly predicted junior and high school grades, as well as ego-resiliency assessed at T1. In all cases, females scored higher than males. No significant effect of age was detected. Finally, as indicated in Figure 1, the model explained a relatively large amount of variance of ego-resiliency and T2 academic achievement.

Moderation by Sex

Given the presence of sex differences in ego-resiliency and academic achievement, we explored if gender moderated the estimates of parameter in our models by using a multiple-group approach. To this aim, we compared the fit of a multiple group model with all parameters freely estimated across males and females, $\chi^2(2) = 0.06$, $p = .97$, CFI = 1.00, TLI = 1.12, RMSEA = .00 (90% CI: .00, .00) with that from the model that constrained correspondent parameters to the exact same values across groups $\chi^2(16) = 24.62$, $p = .08$, CFI = .963, TLI = .934, RMSEA = .00 (90% CI: .00, .11). Using the chi-square difference test, we found no statistically significant difference between the two models $\Delta\chi^2(14) = 16.56$, $p = .28$. Accordingly, we concluded that

gender did not moderate the mediated effect of SES on academic achievement through ego-resiliency.

Ancillary Analysis

An alternative explanation for the longitudinal relation between SES and academic achievement is that ego-resiliency is a moderator (not a mediator) of this longitudinal association. We investigated this hypothesis using a moderated linear regression carried out in Mplus to deal with missing data using FIML and using single indicators (corrected for unreliability), instead of observed variables, as principal predictors. SES, ego-resiliency, and their interaction (i.e., SES*ego-resiliency) were used as predictors of academic achievement at T2, controlling for academic achievement at T1. All variables were centered around their means before being included in the analysis. Given that this model resulted in a saturated path analytic model, it resulted in a perfect fit to the data. The prediction of achievement at T2 by the interaction of SES with ego-resiliency was not significant. Instead, achievement at T2 was significantly, positively predicted only by SES (.17, $p = .015$) and being female (.20, $p < .0001$).

Discussion

Empirical studies have repeatedly documented the association of school grades (and more generally of school success) with students' familial SES (Eamon, 2005; Sirin, 2005; White, 1982) and emotional adjustment (Kwok et al., 2007). Often the reasoning underlying these studies has been that both these variables sustain students' academic life and thus are predictive of long-term schooling outcomes. Yet, thus far, the majority of scholars have focused on the distinct and specific effects of those variables on academic performance (Eamon, 2005; Seipp, 1990; White, 1982) or drop-out (Sirin, 2005; Stein & Kean, 2000). In contrast, very few scholars have examined the joint prediction of academic success from both SES and variables such as

ego-resiliency, examined mediational processes, or tested the reciprocal relation between coping/regulatory flexibility (ego-resiliency) and academic grades.

The results from this study support the value of a theoretical model viewing ego-resiliency—a construct closely related to youth's ability to flexibly regulate emotions (see Eisenberg et al., 2004)—as a mediator of the longitudinal relation between SES and school grades. The findings are consistent with the argument that being resilient, and thus being able to flexibly adapt when stressed, matters to school success (see Blair, 2002; Raver, 2002). The data also suggest that integrating knowledge regarding cognitive constructs linked to academic achievement with knowledge regarding non-cognitive determinants of academic achievement could result in models that substantially advance our understanding of school readiness and academic achievement (Valiente, Swanson, & Eisenberg, 2012).

More generally, our study highlights the value of ego-resiliency as a personality factor linked to individuals' social adjustment. It is likely that the relative advantage experienced by individuals high in ego-resiliency at school is partly based on their higher adaptability to social environments (see Asendorpf & van Aken, 1991), and partly to their higher IQ (see Block & Kremen, 1996). Although our study provides empirical evidence supporting the significant longitudinal indirect effect of family SES on high school grades via ego-resiliency, future studies are needed to disentangle the role of both adaptability and IQ as putative mediators of the relation between ego-resiliency and academic grades.

The observed correlation between family SES and school grades at T1 might be a reflection of the different effects that low and high family SES have on the overall familial environment experienced by youth. In this regard, it seems likely that persistent economic difficulties and consequently impoverished home environments compromise parental monitoring

and involvement (see Conger et al., 2010; Conger & Donnellan, 2007), which would be expected to reduce adolescents' opportunities to develop appropriate self-regulatory and coping skills, and, in turn, undermine their capacity to succeed in increasingly demanding academic settings.

Clearly, our results must be interpreted with care, given they are based on correlational data, and given that it seems unlikely that ego-resiliency is the only indirect pathway linking family SES to academic grades.

Despite the widely attested influence of family SES on later students' academic achievement, not all students from less affluent families display the same risk for poor school adjustment and low academic achievement. It is likely that positive personality traits, such as ego-resiliency, represent mediating factors that help to explain individual differences in the adverse impact of low family SES. Even if personality traits such as ego-resiliency are largely inherited, they can be modified, at least in part, through interventions (Roberts et al., 2017). Our results suggest that it might be useful to provide low-SES students who are low in ego-resiliency with interventions designed to improve the abilities to appropriately and flexibly manage emotions. A recent study (Alessandri, Eisenberg, Vecchione, Caprara, & Milioni, 2016) found that ego-resiliency continues to develop throughout adolescence and emerging adulthood for individuals initially low in ego-resiliency level (and was almost stable for individuals high in ego-resiliency). Emotional self-efficacy beliefs appear to be an important predictor of ego-resiliency development for individuals low in ego-resiliency (Alessandri et al. 2016), and thus may represent a skill by which to improve adolescents' ego-resiliency.

Finally, the gender differences in the present study replicated those in previous research, attesting to a slight academic advantage (Voyer & Voyer, 2014) and higher ego-resiliency (Milioni et al., 2014) for girls compared to boys. However, we found no gender differences in

model parameters, and thus in the longitudinal relations observed among the study variables.

Although the mean levels of the key variables of ego-resiliency and school grades varied across the sexes, the relations among family SES, ego-resiliency, and school grades appeared to unfold similarly.

In regard to potential limitations of this study and future directions, it is important to test the generalizability of our findings across different populations and in different cultural contexts. Beliefs about the regulation and the expression of emotions and the concept of ego-resiliency may show important variations across social contexts and cultures (Mesquita & Frijda, 1992). In addition, the data are essentially correlational and cannot provide causal relations. Also of note, although the correlations among the central study variables were significant and in expected direction, effects were mostly small in size. Moreover, the use of self-report data may be viewed as a major limitation that inevitably biases results. For example, the within-time correlations between measured variables might be inflated by the presence of common method variance. Although school grades may not suffer from this problem, to obtain a better depiction of individuals' personality, it would be desirable in the future to obtain measures of ego-resiliency from multiple informants or using multiple methods (e.g., peers or parental reporters, behavioral measures). Finally, more than two time points are desirable for fully testing mediation but data on academic performance were available at only two time points. A final limitation is that it was impossible to control for students' IQ, which has consistently been demonstrated to predict academic achievement and has been associated with ego-resiliency in previous studies (Bursik & Martin, 2006; Liew, McTigue, Barrois, & Hughes, 2009; Kwok et al., 2007). Nonetheless, controlling for initial grades, which likely are undoubtedly affected by IQ, would be expected to partially alleviate this problem.

Conclusion

The present results provide a methodologically rigorous description of longitudinal relations among family SES, ego-resiliency, and school grades from late adolescence to emerging adulthood. Using a stringent two-wave mediational model, our results support the posited mediational role of ego-resiliency in the longitudinal relation between family SES and youth's academic achievement. Of course, more theoretical and empirical work are necessary to situate ego-resiliency within a comprehensive, multi-layer account of personality (see Milioni et al. 2014, in this regard), and to test the degree to which it is able to uniquely account for within-individual processes in youth's behavior. However, the present results are important because they provide further evidence of the mediating role of personality characteristics related to emotion and its self-regulation in predicting important aspects of adolescents' competence. Our results indicate that it might be useful to consider the evaluation of youth's level of ego-resiliency along with other factors usually assessed in programs aimed to improve adaptation to school.

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Table 1. Means, standard deviations, and zero-order correlations among study variables

	(1)	(2)	(3)	(4)	(5)	Mean	SD
1. Ego-resiliency T1	1					4.83	.75
2. Ego-resiliency T2	.51**	1				4.92	.76
3. Junior high school grades (8th)	.06	.11	1			3.27	1.80
4. High school grades (13th)	.18**	.16**	.63**	1		7.06	.83
5. Family SES	.11	.19**	.16**	.15**	1	.00	.50
6. Sex	.02	.18**	.13*	.27**	.04	-	-
7. Age	-.02	-.02	-.02	-.06	-.00	14.26	.51

Note. sex: 1 = males, 2 = females. The response scale for ego-resiliency ranged from 1 to 7; junior high school grades were assigned by teachers on a 5-point scale; high school grades ranged from 0 to 10; family SES was expressed on a standardized scale with a mean equal to one, and standard deviation equal to 1; sex was coded 1 = male, and 0 = female; age was expressed in years.

* $p < .05$, ** $p < .01$.

Figure 1. The theoretical model

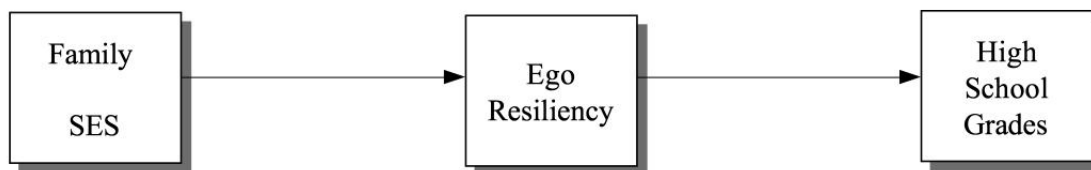
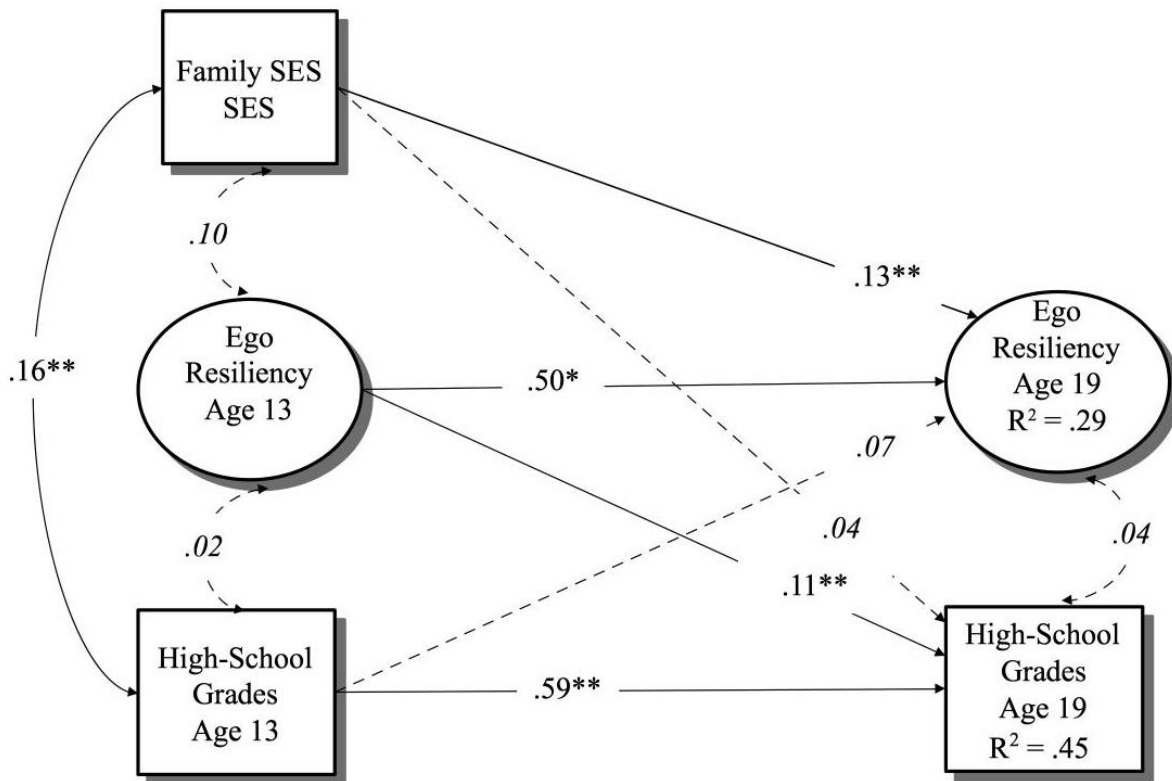


Figure 2. Longitudinal mediational model



Note. Solid lines represent significant paths ($*p > .05$, $**p < .01$) and dashed lines represent nonsignificant paths.