Prosociality During the Transition From Late Adolescence to Young Adulthood: The Role of Effortful Control and Ego-Resiliency

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**Abstract**

The present prospective study examined the prediction of prosociality from effortful control and ego-resiliency from late adolescence to emerging adulthood. Participants were 476 young adults (239 males and 237 females) with a mean age of 16 years (*SD* = .81) at T1, 18 years (*SD* = .83) at T2, 20 years (*SD* = .79) at T3, 22 years (*SD* = .81) at T4, and 26 years (*SD* = .81) at T5. Controlling for the stability of the examined variables and the effect of potential confounding variables (i.e., sex, socioeconomic status [SES], and age), results supported a model in which a temperamental dimension, effortful control, positively predicted a specific behavioral tendency (i.e., prosociality) indirectly through mediation by a personality factor (i.e., ego-resiliency). Practical implications of the results are discussed in terms of the importance of early prevention efforts designed to enhance the capacity to cope effectively with emotional reactions and difficult situations.

**Keywords**

effortful control, ego-resiliency, prosociality, longitudinal mediation

Prosociality refers to an individual’s enduring tendency to enact behaviors such as sharing, helping, and caring (Batson, 2011). Prosociality has been viewed as an important characteristic fostering psychological adjustment during childhood (see Eisenberg, Fabes, & Spinrad, 2006), adolescence (see Carlo, Crockett, Randall, & Roesch, 2007; Eisenberg & Morris, 2004), and emerging adulthood (e.g., Barry, Padilla-Walker,

Madsen, & Nelson, 2008). Consistent with this view, the benefits of helping others appear not to be limited to the recipient of the “good action” but also to extend to the actor. For example, longitudinal findings indicate that prosocial adolescents have better peer relationships compared with less prosocial adolescents (e.g., Eisenberg et al., 2006), are less at risk for internalizing and externalizing problems (e.g., Bandura, Pastorelli, Barbaranelli, & Caprara, 1999), and perform better at school (e.g., Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Wentzel, McNamara-Barry, & Caldwell, 2004). Also, during adulthood, prosocial behavior predicts increasing job satisfaction and performance (e.g., Anik, Aknin, Norton, Dunn, & Quoidbach, 2013). Although not definitive in terms of proving causal relations, these positive correlates of prosociality have led to a focus on the mechanisms and processes that promote prosocial behavior across situations.

While researchers frequently have found rank-order stability of individual differences in prosocial tendencies, supporting the existence of a prosocial personality (e.g., Cote,

Tremblay, Nagin, Zoccolillo, & Vitaro, 2002), empirical findings also suggest some change in the enactment of prosocial behaviors across time (e.g., Kokko, Tremblay, Lacourse,

Nagin, & Vitaro, 2006) and credit the environment for explaining those changes (e.g., Carlo et al., 2007). Probably, the debate on prosocial personality is imbued with a deeper and wider controversy about personality and temperament as variables that are susceptible to the influence of the context and, thus, subject to change (e.g., Shiner & Caspi, 2003).

If certain people are more inclined than others to consider the needs and the welfare of others persons (i.e., have a prosocial or altruistic personality), the systematic study of individual differences is crucial to identify aspects of personality that are conducive to prosocial behavior and might lead children to develop prosocial tendencies and abilities (Caprara, Alessandri, & Eisenberg, 2012). Many of previous relevant studies on the

dispositional determinants of prosociality have identified temperamental characteristics and related individual differences as factors associated with children’s prosociality (see Eisenberg et al., 2006). Both effortful control, considered as the temperamental bases of self-regulation (Rothbart & Rueda, 2005), and ego-resiliency, a related but distinct capacity defined as “the dynamic capacity to contextually modify one’s own level of control in response to situational demands and affordances” (Letziring, Block, & Funder, 2004, p. 396), have sometimes been viewed as dispositional determinants of prosociality (see Eisenberg et al., 2006; Rothbart & Bates, 2006). Nevertheless, most of the work investigating the relations of ego-resiliency or effortful control to prosociality has been conducted with children (Diener & Kim, 2004; Eisenberg et al., 1996; Taylor, Eisenberg, Eggum, Sulik, & Spinrad, 2013) and has considered only one of these variables at a time. Thus, there is limited research on how these variables might jointly affect the development of prosociality during the transition from early adolescence to early adulthood or, indeed, at any age. This study was designed to fill these gaps in the research. Using data from a relatively large sample of 476 adolescents followed for about 10 years (i.e., from approximately 16 to 26 years), we were able to test the goodness of fit of a longitudinal conceptual model in which both effortful control and egoresiliency were used as unique predictors of prosociality from late adolescence to emerging adulthood.

**Prosocial Behaviors and Effortful Control**

The construct of effortful control reflects a set of relatively deliberate control functions needed for voluntary and goal directed behavior (see Rothbart & Bates, 2006): It is related to the ability to modulate both behavior and emotions and involves some executive functioning capacities (i.e., planning, detecting errors, assimilating information, etc.). Effortful control includes inhibitory control (i.e., the ability to inhibit behavior as needed) and attentional control (i.e., the ability to voluntary manage attention), as well as planning. One might argue that being sensitive to others’ needs requires a capacity to regulate negative reactions, delay gratification, hold one’s personal needs in abeyance, and plan and activate a course of action that benefits others. Consistent with such arguments, empirical findings have supported an association between prosociality and effortful control. For example, effortful control has been associated with peers’(Eisenberg et al., 1996; Eisenberg et al., 1997) or teachers’reports (Diener & Kim, 2004) of children’s and adolescents’prosocial behaviors. Using a person-centered approach, Veenstra et al. (2008) found that clusters of preadolescents characterized by high levels of prosociality had the highest level of effortful control.

Moreover, some capacities linked to prosocial responding, such as sympathy, have also been positively associated with effortful control (e.g., Eisenberg et al., 2007; Rothbart

& Bates, 2006). Indeed, Eisenberg et al. (1996) proposed that in empathy-inducing situations, individuals high in effortful control are generally predisposed to experience sympathy (i.e., an other-oriented response to another’s emotion or condition) rather than personal distress (i.e., a self-focused, aversive response to another’s emotional state or condition) when exposed to cues regarding another’s emotion or negative state. This is because the lack of effortful control is likely to result in empathic overarousal in evocative contexts involving others’ emotional states or needs (Eisenberg et al., 2006;

Rothbart & Rueda, 2005), which may trigger aversive affective reactions to the vicarious experiencing of another’s emotion (e.g., discomfort, anxiety; Batson, 2011). In addition, effortful control seems to play an important role in the development of an internalized morality that sustains prosocial tendencies (e.g., Kochanska, Murray, & Harlan, 2000). Thus, effortful control appears to provide the attentional flexibility and behavioural regulation required to connect the regulation of negative emotionality with the experience of sympathy and the enactment of moral principles (Rothbart & Rueda,

2005). While systems associated with effortful control develop rapidly in the early years of life (Rothbart & Bates, 2006), overall regulatory skills continue to mature throughout adolescence (Collins & Steinberg, 2006; Steinberg, 2008). Indeed, as demonstrated in recent research, “in emotional contexts, adolescents’ impulse-control ability is severely taxed relative to that of children and adults” (Casey, 2013, p. 86; see also Casey, Jones, & Hare, 2008). This makes the study of effortful control important for understanding youths’emotional and social functioning. Due to the many changes youths experience during adolescence, at personal, interpersonal, and social levels, the tendency to enact prosocial behaviors might be favorably affected by the capacity to be self-regulated emotionally and behaviorally. In summary, the research is consistent with the view that adolescents’ (as well as children’s) abilities to willfully and effortfully regulate their own behavior and emotion contribute to prosocial behavior, both directly and possibly through their effects on other capacities affected by possessing regulatory skills.

**Prosocial Behaviors and Ego-Resiliency**

From a variable-centered perspective, ego-resiliency is considered a key personality construct for understanding motivation, emotion, and behavior (Block & Block, 1980). Individuals high in ego-resiliency (also called ego-resilient individuals) are believed to be active in making their environment compatible with their personality due to their ability to cope effectively and flexibly with changes and difficulties (Block & Block, 1980). Ego-resiliency is viewed as an inherited constitutional trait, with an estimated heritability of 77% in boys and 70% in girls (Waaktaar & Torgersen, 2012), that is associated with differential reactivity in specific affective regions of the brain, such as the insula and amygdale (Waugh, Fredrickson, & Taylor, 2008). Because individuals high in ego-resiliency are well regulated, flexible, and able to adapt quickly to external stressors, they are expected to behave prosocially and empathically, although research on the association of prosociality and egoresiliency is limited (see Eisenberg et al., 2006). As posited by Taylor et al. (2013), people who are able to recoup from stress are likely to be more responsive to others’ emotional states and needs. In contrast, it is likely that individuals low in ego-resiliency are prone to be overwhelmed by worry and anxiety in the face of environmental changes, which precludes attending to others and acting in a manner that promotes their well-being. Conversely, individuals low in ego-resiliency (in a manner similar to regulation; see Eisenberg, Spinrad, & Morris, 2014) might be expected to experience feelings of personal distress when exposed to others’ negative emotions, which would be expected to result in an excessive focus on the self rather than others. In their longitudinal study, Block and Block (1980) found that children high in ego-resiliency were more appropriate when expressing emotions, and more socially competent and more empathic, than other children. In this vein, Taylor et al. (2013) found that ego-resiliency assessed at 18 months positively predicted the level of children’s empathy at 24 months, which in turn mediated the relation of ego-resiliency to children’slater prosocial behavior (e.g., at 72/84 months). Importantly, these authors provided longitudinal evidence that children with higher levels of ego-resiliency had steeper increases in empathy and that these increases were associated with children’s later prosocial behavior. These results are in agreement with those of Atkins, Hart, and Donnelly (2005), who found that resilient children were more likely than overcontrolled and undercontrolled children to volunteer during adolescence. However, this study used cluster analysis to derive prototypes of theoretical profiles of egoresilient children, and thus, it is unclear whether and how these results generalize to studies based on a variable-centered perspective on ego-resiliency. Other researchers have reported significant relations between teacher-rated egoresiliency in preschool children and their ratings of children’s agreeableness (i.e., a trait closely associate with prosociality; Cumberland-Li, Eisenberg, & Reiser, 2004; also see Graziano, 1994) and between self-report of ego-resiliency and agreeableness in adolescence (Alessandri, Vecchione, Letziring, & Caprara, 2012).

**Effortful Control and Ego-Resiliency**

Although effortful control and ego-resiliency would be expected to be substantively correlated in late adolescence, they actually refer to different constructs, each playing a specific role in the process of self-regulation. Effortful control is a superordinate construct that includes temperamentally based regulatory skills, such as attentional and inhibitory control and planning (Rothbart & Bates, 2006); these skills can be (but may not always be) used as needed to react in a flexible manner (i.e., to be ego-resilient) during the actual *process* of modulating emotion in specific contexts. In contrast, ego-resiliency reflects individuals’ dynamic and resourceful adaptability or characteristic coping style with stress and the ability to rebound (Block & Block, 1980). Ego-resiliency is expected to be influenced by temperamental and other personality characteristics (e.g., effortful control, emotionality), learning (e.g., the acquisition of coping skills), and the nature of the stressors in a particular context. In other words, ego-resiliency is viewed as less constitutionally based than other regulatory constructs such as effortful control and is influenced by the capacities involved in effortful control as well as other factors. Ego resiliency refers to how well and flexibly individuals adapt to and/or deal with stressful interactions (Eisenberg et al., 2003). Consistent with the differentiation between effortful control and egoresiliency, using structural equation modeling, Hofer, Eisenberg, and Reiser (2010) found empirical support for the distinction between ego-resiliency and effortful control (see also Eisenberg et al., 2003; Eisenberg et al., 2004).

**Prosocial Behaviors, Effortful Control,and Ego-Resiliency: A Developmental Outlook**

The present prospective study was designed to examine how effortful control and ego-resiliency might jointly predict the tendency to behave prosocially (i.e., exhibit prosociality). We posited a model in which effortful control predicts prosociality indirectly through its influence on ego-resiliency (see Figure 1). We assigned primacy to effortful control in the posited set of pathways in accordance with a vast literature arguing that effortful control is a major component of temperament (Caspi, 1998; Rothbart & Bates, 2006) and that it is linked to anger regulation, control of negative affect, and the ability to deal effectively with frustration due to other people (e.g., Haas, Omura, Constable, & Canli, 2007; Shiner & Caspi, 2003). As argued above, effortful control and ego-resiliency are expected to relate to one another in specific ways. In particular, from a developmental perspective, theorists (Caspi, 1998; Eisenberg et al., 2004) have proposed that temperamentally based effortful control or related executive functioning contributes to development of personality traits such as ego-resiliency. For example, Martel et al. (2007) suggested that the development of ego-resiliency depends on the maturation of frontal neural circuits that support deliberate self-regulation (which involves effortful control), a capacity that is at the basis of the individual’s ability to enact thoughtful and deliberate control of behavior in response to changing contextual demands. The argument is that because effortful control can be voluntarily controlled by the individual, it provides skills that can be used (but may not always be used) to adapt in a flexible manner (Hofer et al., 2010). Based on the limited empirical work, one can argue that effortful control is related to higher levels of ego-resiliency in children (Eisenberg et al., 2003) and adolescents (Hofer et al., 2010), partly because it provides basic skills needed for flexible adaptation in context. In brief, effortful control operates as a temperamental-based mechanism providing the basis for the flexibility and adaptability in social interactions often displayed by resilient individuals (Hofer et al., 2010). Consistent with these arguments and findings, our first hypothesis was that effortful control would indirectly promote prosociality through ego-resiliency (see Figure 1). This hypothesis is in agreement with previous studies showing that ego-resiliency mediates the relation between children’s effortful control and several aspects of psychological adjustment such as social competence, agreeableness, or internalizing problems (Cumberland-Li et al., 2004; Eisenberg et al., 2000; Eisenberg et al., 2004; Spinrad et al., 2006). Moreover, it seems likely that effortful control predicts individual differences in the ability of resilient individuals to effectively manage and appropriately express positive and negative emotions under varying, and often unpredictable, life circumstances— that is, the personality trait of ego-resiliency (Block & Block, 1980). Because the regulatory skills associated with effortful control continue to develop during adolescence (Casey, 2013; Casey et al., 2008; Collins & Steinberg, 2006), they would be expected to contribute to adolescents’ abilities to modulate their behavior and reactions to stressful events that are relevant to sympathy and other orientation. Furthermore, the literature documents that a higher level of ego-resiliency is associated with higher empathic responding (Taylor et al., 2013) in early childhood and lower egocentrism and higher perspective taking in childhood (Gjerde, Block, & Block, 1986). This is probably because individuals high in ego-resiliency possess the ability to quickly bounce back from negative emotions such as anger and despondency, an ability that is likely critical for avoiding excessive contagion from others’ negative emotions and, hence, emotional overarousal, avoidance of the distressed other, and/or callousness in dealing with others in need (Eisenberg et al., 2006). Accordingly, our second hypothesis was that ego-resiliency would predict prosociality over time (see Figure 1). However, in our model, we did not exclude the possibility that, over time, prosociality contributes to effortful control and ego-resiliency. Effortful control, although rooted in temperament, is amenable to change due to experience (Rothbart & Bates, 2006), as is the personality trait of ego-resiliency. Thus, the tendency to behave habitually in a manner that benefits others might predict effortful control and ego-resiliency over time by providing the conditions for practicing and further strengthening a sense of competence and the abilities at the basis of flexible self-regulation (Metz & Youniss, 2003; Staub, 1979). Furthermore, in the long run, it is likely that the engaging in prosocial behavior changes individuals’ subsequent self-perceptions about their own ability to deal with social emotions (Eisenberg et al., 2006). Previous studies support the potential role of prosociality for changing basic dispositions. For example, individual differences in prosociality have predicted in 4-year panel models both empathic self-efficacy (Alessandri, Caprara, Eisenberg, & Steca, 2009) and personality agreeableness (Caprara et al., 2012). In summary, it seems likely that mastering experiences associated with behaving prosocially promotes individuals’abilities in the sphere of emotion regulation and, more broadly, adaptive social interactions. Thus, we estimated the longitudinal paths from prosociality to effortful control and ego-resiliency (Figure 1). In addition, all variables were posited as correlated within time following recommended procedures for testing longitudinal mediational (Cole & Maxwell, 2003). In considering the longitudinal relations among prosociality, effortful control, and ego-resiliency, we cannot disregard that these personality dimensions are related to the Big Five traits of personality (McCrae & Costa, 2008). In fact, effortful control, ego-resiliency, and prosociality have been conceptually and empirically linked to some of the Big Five traits (e.g., Openness to Experience, Conscientiousness, Energy/Extraversion, Agreeableness, and Neuroticism/ Emotional Stability) in previous studies (see Alessandri et al., 2012; Graziano, Habashi, Sheese, & Tobin, 2007; Letziring et al., 2004; Rothbart & Bates, 2006). Consequently, as a preliminary step, we investigated whether observed correlations among constructs of interest decreased significantly after controlling for the Big Five. The present work, in comparison with relevant prior studies, is novel in several respects. To our knowledge, this is the first study that simultaneously considered effortful control and ego-resiliency as predictors of prosociality across a very large and important developmental phase (i.e., the transition from adolescence to young adulthood). Previously researchers typically considered only one of these variables at a time and/or predicted a measure of peer competence or agreeableness rather than prosociality (Cumberland-Li et al., 2004; Eisenberg et al., 1997; Hofer et al., 2010). Moreover, in testingthe hypothesized model, we used a very stringent longitudinal mediation model (Cole & Maxwell, 2003) and we controlled for several covariates such as sex, socioeconomic status (SES), and age that have been often associated with prosociality (see Penner, Dovidio, Piliavin, & Schroeder, 2005). Although individual differences in these variables were not the primary focus of our interest, we controlled fortheir potential effects to obtain more reliable parameter estimates. Finally, an additional strength of the study is that both self- and friend-report measures of individuals’ prosociality were obtained at the last assessment, which would be expected to reduce any social desirability bias arising from the sole use of self-evaluation of socially valued behaviors.

**Method**

*Participants*

The participants were 476 young adults (239 males and 237 females). At Time 1 (T1), the ages ranged from 15 to 17 years (*M* = 15.88, *SD* = .81); at Time 2 (T2) from 17 to 19 years (*M* = 18.00, *SD* = .83); at Time 3 (T3) from 19 to 21 years (*M* = 20.01, *SD* = .79); at Time 4 (T4) from 21 to 23 years (*M* = 22.03, *SD* = .81); and at Time 5 (T5) from 25 to 27 years (*M* = 26.03, *SD* = .81). All participants were from Genzano, a residential community near Rome, and were from families of origin involved in an ongoing longitudinal study in that community since the participants were 8 years of age. The study was described to the parents and the children as a project designed to gain a better understanding of child development, and families matched the characteristics of Italian population. The socioeconomic characteristics of the sample considered for the present analyses also matched that of average Italian youths of a similar age across the years in which the study was performed (Istituto Italiano di Statistica, 2002). The families of origin (i.e., the parents of the young adults in the present sample) represented a socioeconomic microcosm of the larger Italian society: at T1, 14% were in professional or managerial ranks, 25% were merchants or operators of other businesses, 31% were skilled workers, 29% were unskilled workers, and 1% was retired. In addition, the composition of the families matched national data with regard to type of families and number of children. Most participants were from intact families (94.8%) and, on average, from one-child families (about 60% of total sample). At T5, about half (46.6%) of the sample were college students. Of the remaining participants, 70% had stable work, 9% worked occasionally, 13% were unemployed, and 7% were searching for a job. The average number of years of schooling was 13 years; 94% of participants were unmarried, and only 1 participant was divorced. Only 4% of participants had children. At T5, participants were instructed that, in addition to filling out self-report questionnaires, they should distribute additional copies designed for peer ratings to a “friend” who knew them “very well.” Therefore, we had a single additional informant for 156 of the 164 participant included at T5. These informants (61% females) ranged in age from 20 to 44 years (*M* = 25.94, *SD* = 4.15). On average, these raters knew the target participant for a mean of 9.45 years (*SD* = 6.61). Peers responded to two single Likert-type scale items asking the following: (a) how well they knew the participant and (b) to what degree they felt emotionally close to the participant, with possible responses ranging from 1 (*not at all*) to 10 (*very much*). The mean response was 8.48 (*SD* = 1.19) for the first item and 9.13 (*SD* = 1.16) for the second item. In general, these raters felt close with the target participant and knew him or her well.

*Attrition*

At T1, informed consent was obtained from 100% of the families. A total of 21% of participants were not assessed at T2 (so the total *n* = 376; 49% females); about 1% of T2 participants (total *n* = 369; 78% males) were not assessed at T3; about 22% of T3 participants (total *n* = 254; 45% females) were not assessed at T4; and 22% of T4 participants (total *n* = 164; 47% females) were not assessed at T5. In sum, the total attrition rate was high (about 66%) due to lack of funds for extensive follow-up. Attrition was mainly due to absence from school at the time of the assessment (at T1, T2, and T3), relocation from the area, or an inability to contact the participant (T4 and T5). Of importance, analyses of variance suggested that the attrited participants did not significantly differ from their counterparts on any of the variables in the initial assessment (i.e., demographics, effortful control, ego-resiliency, prosociality); nor did the groups differ in the covariance matrices as tested by the Box M test for homogeneity of covariance matrices. In sum, attrition appeared not to be systematic.

*Measures*

*Effortful control.* In this study, effortful control included processes related to emotional regulation, as well as the abilities to voluntarily focus and shift attention, to voluntarily inhibit or initiate behaviors, and planning (Rothbart & Bates, 2006).

Effortful control was assessed using self-reports (1 = *absolutely false for me* to 5 = *absolutely true for me*) on 12 itemsfrom the Big Five Questionnaire (BFQ; Caprara, Barbaranelli,Borgogni, & Perugini, 1993; from the Conscientiousnessand Emotional Stability subscales) that were deemed toreflect effortful control in regard to the subdimensions ofattentional focusing and inhibitory control (e.g., “It’s difficultfor me to give up an activity I’ve undertaken”; “If I failin a task, I keep trying until I succeed”; and “I do not usuallyreact in an impulsive manner”). Negatively worded items were reversed to indicate high effortful control (αs = .72, .76,.77, .75, and .65 from T1 to T5, respectively).

*Ego-resiliency.* The ER89-R (Alessandri, Vecchio, Steca, Caprara, & Caprara, 2008; Vecchione, Alessandri, Barbaranelli, & Gerbino, 2010) is a brief inventory consisting 10 items (found in the online supplemental material available at http:// pspb.sagepub.com/supple-mental) drawn from the original 14 items included in the ER89 scale developed by Block and colleagues (see Letziring et al., 2004). Participants were asked to indicate the degree to which they agreed with each statement on a scale ranging from 1 (*does not apply at all*) to 4 (*applies very strongly*). The psychometric properties of the instrument have been confirmed in both cross-cultural and longitudinal research (Alessandri et al., 2012; Vecchione et al., 2010). Sample items include “I quickly get over and recover from being startled,” “I get over my anger at someone reasonably quickly,” and “I am more curious than most people” (αs = .87, .84, .85, .86, and .84 from T1 to T5, respectively).

*Prosociality.* Participants rated their prosociality on a 16-item scale (1 = *never/almost never* true; 5 = *almost always*/*always* *true*) that assesses the degree of engagement in actions aimed at sharing, helping, taking care of others’ needs, and empathizing with their feelings (Caprara, Steca, Zelli, & Capanna, 2005; for example, “I try to help others” and “I try to console people who are sad”; αs = .92, .89, .94, .93, and .94 at Times 1-5, respectively). Researchers have also found a moderately high correlation (*r* = .54) between self- and other-ratings on this prosociality scale, further supporting its validity (Caprara et al., 2012). These same items were worded in the third person for the friend-report measure of participants’ prosociality (α = .94 at T5). *Traits.* We measured the traits component of personality with the reduced version of the Big Five Questionnaire (BFQ-R; see Caprara et al., 1993). The BFQ-R contains 60 items, with a response scale ranging from 1 = *very false for me* to 5 = *very true for me*. The alpha reliability coefficients from T1 to T5 of the five domain scales ranged from .78 and .77 for Openness, from .83 to .81 for Conscientiousness, from .80 to .77 for Energy/Extraversion, from .81 to .80 for Agreeableness, and from .89 to .88 for (Emotional Stability).

*SES.* Familial SES was based on the occupation and education of both mothers and fathers (Sirin, 2005). To derive a SES index, we performed a confirmatory factor analysis, using the weighted least square minimum variance (WLSMV) as the method of estimation (Muthen & Muthen, 2013), where SES was defined as a latent factor loaded by parents’ education and occupation. After establishing the unidimensionality of the indicators (54% of variance explained), we estimated the factor score (for each person) of SES.

*Missing Data*

Our modeling assumed that the missing values were “missing at random” (i.e., missingness is related to the observed values for the variables in the data set but unrelated to unobserved missing values). We examined this assumption using the Little’s test (R. J. A. Little & Rubin, 2002) for data missing completely at random (MCAR) as implemented in SPSS 14. This test resulted in a nonsignificant value (i.e., χ2 = 823.76, *df* = 777; *p* = .12). Thus, we handled missing data in Mplus 6 by using the Full Information Maximum Likelihood (FIML) algorithm. The final sample size for this study was 476 (239 males and 237 females).

**Results**

*Zero-Order Correlations*

Zero-order correlations (Table 1) were mostly as expected. For example, effortful control and ego-resiliency were positively correlated, both concurrently (*r*s ranged from .27 to .48) and over time (*r*s ranged from .24 to .34). Effortful control and prosociality were correlated concurrently (*r*s from .10 to .28) but not over time (*r*s from .09 to .15). Egoresiliency and prosociality were modestly to substantially positively correlated concurrently (*r*s from .45 to .58) and over time (*r*s from .23 to .43). Friend-rated prosociality at T5 was significantly correlated within time with ego-resiliency, but not with effortful control, and significantly correlated with ego-resiliency at T1, T3, and T4 (Table 1). Stability coefficients were high for all constructs: effortful control (*r*s from .54 to .64), ego-resiliency (*r*s from .39 to .61), and prosociality (*r*s from .59 to .75). Self-and friend-reports of prosociality were substantially correlated (*r* = .47), providing evidence of convergent validity. Table 2 presents the average correlations between each of the Big Five and the study variables from T1 to T5.1 As expected, almost all correlations were from moderate to high (except for the correlation of prosociality with emotional stability).

*Relations to the Big Five.* To ascertain whether the relations among effortful control, egoresiliency, and prosociality changed when the Big Five traits were taken into account, we examined the size of the difference between zero-order and partial correlations (controlling for the Big Five at once) for a given relation. The significance of the differences was assessed by using the bias-corrected bootstrap method (Efron, 1982). This bootstrap analysis was performed in two steps. In the first step, 5,000 new samples were generated by randomly resampling with replacement from the available data, under the condition that each of the 5,000 samples had the same size as the original one. In each sample, we first computed zero-order and partial correlations within time. We then computed longitudinal zero-order and partial correlations between one variable assessed at a given time point (e.g., effortful control at Time 1) and another variable assessed at the subsequent time point (e.g., ego-resiliency at Time 2), while controlling for the Big Five assessed at the previous time point (Time 1). A difference between corresponding zero-order and partial correlation coefficients was then derived for each sample and then averaged (Tables 3 and 4). Finally, critical values for the upper and lower 95% bias-corrected confidence limits of this difference were estimated. Results showed that the size of the correlations among the study variables decreased after controlling for the Big Five (see Tables 3 and 4). The observed reductions, however, were moderate in size, ranging from ranging from −.11 to −.01 for concurrent correlations and from −.13 to −.01 for longitudinal correlations. Most important, these reductions were not statistically significant, as confidence intervals associated with each difference did contain 0.

*Analytic Strategy*

We used structural equation modeling (SEM) to test the model using Mplus 7.11 (Muthen & Muthen, 2013). To evaluate fit of a structural model to data, we considered the χ2 goodness of fit, supplemented by root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker–Lewis Index (TLI). We accepted values under .08 for RMSEA and greater than .90 for CFI and TLI (Bentler & Bonett, 1980). We calculated mediated effects using the procedures outlined by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) and used their recommended asymmetric confidence interval (95% CI) method to formally test mediation (Mackinnon et al., 2002). In all models, the latent variables for effortful control, ego-resiliency, and prosociality at T1, T2, T3, T4, and T5 were created using two indicators (composed by the same number of items) via parceling from each original scale (i.e., we randomly assigned items to each of the two indicators). Item parcels are likely to increase the stability of the parameter estimates, improve the variable to sample size ratio, and reduce the effects of nonnormality (e.g., T. D. Little, Cunningham, Shahar, & Widaman, 2002). At T5, prosociality was included as a latent factor defined by three indicators, namely, the individual’s mean score on other-rated prosocial and two parcels constructed from the self-reported measure. In doing so, we followed a suggestion by T. D. Little et al. (2002), who advocates the use of three parcels. As a check of this decision, we compared the results of a model with two indicators for both self- and other-rated prosociality at T5. The parameter estimates were nearly identical, and thus, we present results for the model with only one indicator forother-rated prosociality at T5 based on greater parsimony and a generally better overall fit of the model.

*Construct Distinctiveness*

First, we specified, within each time point, a correlated threefactor model (effortful control, ego-resiliency, and prosociality on separate latent constructs). Four alternative models were then compared: (a) a one-factor model in which all three constructs were on the same latent factor, (b) a twofactor model with effortful control and ego-resiliency were combined and prosociality on a separate construct, (c) a twofactor model with effortful control and prosociality combined and ego-resiliency on a separate construct, and (d) a two-factor model with ego-resiliency and prosociality combined and effortful control on a separate construct. Because these models are often viewed as not nested (see Self and Liang, 1987, for a discussion), the Akaike information criterion (AIC) and Bayesian information criterion (BIC) were used to select the best model (although results did not change using the usual chi-square difference test). According to the minimum values of these indices, the three-factor model fit better than alternative model (see Table 5), supporting the empirical distinctiveness of the constructs.

*Longitudinal Cross-Lagged Modeling*

We then specified a SEM with 15 constructs and 3 control variables (Figure 2). The model included all cross-lagged paths (e.g., effortful control at T1 to resiliency at T2), stability paths (autoregressive) for each construct across time, and correlations among concurrent constructs at all time points. This allowed us to test the likely direction of effects among constructs because cross-lagged paths would reflect acrosstime effects controlling for prior levels of a construct. At each time point, all constructs were regressed on all control variables. Following standard procedures (Cole & Maxwell, 2003), unique variances of the study variables were also allowed to covary within construct (i.e., across time but only for the same reporter). The model fit was adequate, χ2(401) = 1,304.88, *p* < .01; RMSEA = .059 (CI = [.055, .062]); CFI = .940; TLI = .930. We then examined the invariance of the loadings and error variances for indicators across time to test whether we could constrain the relations of the latent variables (and their residual) to the manifest variables to be constant over time. Starting with a baseline model, increasingly restrictive hypotheses were evaluated by constraining indicator loadings and error variances to equality across waves using chi-square difference tests. Constraining factor loadings and residual variances for all variables (we did not impose any constraint on variance or loadings of peer-rated prosociality at T5 because this variable was assessed only once) did not result in a significant change of fit: Δχ2(12) = 20.10, *p* = .07; thus, factor loadings and error variances were constrained to be equal across time points for all of our variables. We additionally placed a series of constraints in our model to determine whether there were significant differences in the effects of our constructs at different time points. Specifically, we constrained (a) the autoregressive paths to be equal across time, to investigate whether the temporal stability of the variables varied significantly across adjacent time points, (b) the cross-lagged paths, to examine whether the strength of prediction varied over time, and (c) the residual correlations among residuals of effortful control, ego-resiliency, and prosociality within time (from T2 to T5, depicted in gray in Figure 2). Constraining all of the above mentioned paths did not result in a significant change of fit: Δχ2(35) = 47.78, *p* =.07. Therefore, constraints were retained for all pathways in the model. The final model demonstrated an adequate fit to the data: χ2(448) = 1,328.76, *p* > .01; RMSEA = .062 (CI = [.058, .065]), CFI = .939; TLI = .929. Factor loadings for the latent variables were all significant and ranged from .54 to .88 (Table 6).

*Autoregressive paths and concurrent relations.* As can be seen in Figure 2, the variables were highly stable across the three time points. Each variable (effortful control, ego-resiliency, or prosociality) also was significantly positively associated with the other two variables within time at all five time points.

*Cross-lagged paths.* Despite the stability of constructs across time and the correlations within time, the hypothesized cross-lagged paths were significant. Effortful control predicted ego-resiliency across time. In turn, ego-resiliency longitudinally predicted prosociality, and prosociality predicted ego-resiliency (but not effortful control). We examined whether the relation between effortful control and prosociality was mediated through ego-resiliency and found a significant unstandardized indirect effect of (*B* = .09; *z* = 5.49; 95% CI = [.05, .13]). In regard to cross-lagged relations between ego-resiliency and prosociality, the results suggest that these variables might influence reciprocally the development of each other. We tested whether the relation between earlier egoresiliency and later ego-resiliency (e.g., ego-resiliency at T1 and ego-resiliency at T3) was mediated through prosociality, longitudinally. The unstandardized indirect effect of ego-resiliency at T1 on ego-resiliency at T3 through prosociality at T2 was significant (*B* = .02; *z* = 2.32), and the associated confidence interval did not include zero (95% CI = [.01, .07]), thus supporting mediation. Moreover, the relation between earlier prosociality and later prosociality (e.g., prosociality at T1 and prosociality at T3) was mediated longitudinally through ego-resiliency. The unstandardized indirect effect of prosociality at T1 on prosociality at T3 through ego-resiliency at T2 was also significant (*B* = .07; *z* = 5.76), and the associated confidence interval did not include zero (95% CI = [.03, .12]).

*Control variables.* Sex significantly, positively predicted effortful control at T3 (β = .43, *SE* = .12. *p* < .05) and at T2 (β = .41, *SE* = .12. *p* < .05), with females scoring higher. Similarly, sex positively predicted prosociality at T1 (β = .79, *SE* = .01. *p* < .05), T2 (β = .36, *SE* = .08. *p* < .05), T3 (β = .41, *SE* = .08. *p* < .05), and T5 (β = .34, *SE* = .11. *p* < .05) (but not at T4); females were higher. Age and SES were unrelated to effortful control, ego-resiliency, and prosociality. *Observed effect sizes.* Finally, the model accounted for a large proportion of variability for all variables with *R*2 coefficients (T2-T5), ranging from .22 (T2) to .43 (T5) for effortful control, from .39 (T1) to .59 (T5) for ego-resiliency, and from .35 (T1) to .42 (T3 and T5) for prosociality. Coefficients for the longitudinal path linking effortful control to ego-resiliency were moderately high in size, whereas the coefficients associated with the longitudinal paths linking ego-resiliency to prosociality and also prosociality to ego-resiliency were moderate in size, according to common standards (Cohen, 1992).

**Discussion**

A number of researchers in recent years have investigated the role of different dispositional determinants of individual differences in prosocial behavior (Caprara et al., 2012; Eisenberg et al., 1997; Graziano et al., 2007). However, to our knowledge, no previous longitudinal work has focused on the differential contribution of effortful control and egoresiliency to prosociality, nor on how these variables might operate in concert over time, especially during the transition to young adulthood (although Eisenberg et al., 1997, predicted a construct including a combination of young schoolchildren’s prosociality and social skills from self-regulation with resiliency as a mediator). Our work addressed the need both to better understand dispositional determinants of prosociality and to examine the value of different intrapersonal structures in predicting individual differences in prosociality. Filling these gaps is essential to build an overarching theory of the dispositional determinants of prosocial development from late adolescence to emerging adulthood. Overall, the present findings corroborated the posited conceptual model in which a temperamental construct such as effortful control predicted a specific behavioral tendency like prosociality through the mediation of the personality dimension of ego-resiliency. This pattern of prediction held when taking into account the stability of the examined variables, prior contemporaneous correlations among variables, and the effect of potential confounders (such as sex, SES,and age). Moreover, the findings represent an important extension of prior work for several reasons. To our knowledge, this is the first study that considered longitudinally the predictive role of both effortful control and ego-resiliency on prosociality per se. Despite the fact that the correlational nature of these data limits inferences regarding causality, the findings in this study are consistent with the view that effortful control plays a role in setting the potential for prosociality, whereas ego-resiliency serves to provide the needed flexibility and adaptive coping needed for turning individuals with the capacity for regulation into prosocial individuals. Self-reports and others’ ratings of prosociality showed a moderately high degree of convergence at T5. Moreover, earlier prosociality significantly predicted later ego-resiliency in accordance with the view that behaving prosocially might strengthen people’s ability to flexibly regulate their own emotionality during difficult social interactions and increase feelings of self-efficacy and social competence (Midlarksy & Kahana, 2007). The conjoint significance of the paths (a) from ego-resiliency to prosociality at a later time point and (b) from prosociality to ego-resiliency at a later time point suggests that the relations between ego-resiliency and prosociality are dynamic and reciprocal from late adolescence to emerging adulthood. While increasing egoresiliency might promote prosociality, mastering experiences associated with behaving prosocially might in turn promote ego-resiliency. This is consistent with Staub’s (1979) suggestion that helping others can lead people to further behave prosocially and experience prosocial motives. Of importance, this study shows that effortful control appeared to provide a basis for ego-resiliency, whereas the latter provided access to a mechanism by which effortful control might foster prosociality. In contrast, ego-resiliency and prosociality did not predict effortful control across time. Given that the transition from late adolescence to emerging adulthood is often viewed as a time of relatively rapid change in self-perceptions (e.g., identity; see Breunlin, 1991), effortful control and ego-resiliency might have important effects on youths’ emerging prosocial self-perceptions and behaviors. Furthermore, the regulation of emotions and behaviors (typical of effortfully controlled individuals) together with affect the tendency to behave prosocially but also counteract the self-centered tendencies observed across this phase of human development. Also of interest, there were relations in the model among effortful control, ego-resiliency, and prosociality within time even when controlling for prior relations among them and their stability over time. This pattern suggests that the variables have some effect on another at a particular point in time beyond prior relations. These effects within time might contribute to the across-time relations (e.g., prediction of egoresiliency by effortful control) apparent subsequent to each assessment. In addition, prosocial behaviors longitudinally predicted ego-resiliency but not effortful control. On one hand, one may hypothesize that youths who act in prosocial ways might gain in flexibility when they have to cope with difficulties because they are more trained to adapt to the needs of others and to the requests from the context of belonging. This mechanism could reflect the continuous plasticity of the development of personality during the transition from late adolescence to early adulthood to behavioural and contextual influences. On the other hand, temperamentally based effortful control could be less dependent, especially in this developmental phase, on environmental and behavioral influences and more anchored to heredity (including its effects on prefrontal changes in adolescence) and early developmental experiences (Posner & Rothbart, 2000). These speculations could be further examined in future studies. We found that sex predicted effortful control and prosociality at several time points. In accordance with previous findings, women outscored men in both effortful control and ego-resiliency (Alessandri et al., 2009; Caprara et al., 2012; Eisenberg et al., 2006). One could argue that due to gender role socialization, most women develop relatively high levels of effortful self-regulation or prosociality (Eisenberg et al., 2006). Although this interpretation is consistent with the consistency of the gender differences that have been observed across time, and across method of assessing prosociality, it does not rule out other biological and social determinants. Of interest, effortful control, ego-resiliency, and prosociality showed moderate-to-high correlations with the Big Five, in line with existing literature. Moreover, our data suggest that controlling for the effect of the Big Five lead to a moderate decrease in the size of the correlations among study variables. Observed results, however, are not definitive in this regard. They might be affected by the specific nature of measures used in this study—the fact that the scale of effortful control was originally computed from items on the conscientiousness and emotional stability factors, and thus, those items were omitted from the latter scales when correlated with the measure of effortful control.

*Limitations and Future Directions*

The fact that the study involved mostly self-report data can be viewed as a major limitation. For effortful control and ego-resiliency, this issue is mainly linked to study implementation and design. Essentially, over the years, funding constraints prevented obtaining other measures of both constructs. Yet, one may claim that no one is in a better position than the agents of interest to know and report about their own tendencies to behave prosocially across contexts. Of course, social desirability is always a source of concern when assessing socially valued behaviors such as prosociality. However, this issue is minimized by the fact that we have obtained a fairly high level of consensus, both within and across time, between self-reports and others’ ratings of prosociality. In addition, by controlling for prior levels of variables, consistent biases in reporting should be partly controlled. In the future, it would be desirable to test the generalizability of our findings across different populations and in different cultural contexts. The tendencies to pursue others’ well-being may, in fact, vary under various life conditions and across social contexts and cultures (see Eisenberg et al., 2006). An idea not tested in this study was whether effortful control and ego-resiliency might interact in the prediction of prosociality. This point merits empirical investigation in future studies. A final limitation is the higher attrition rate of the participants during young adulthood. These data should be interpreted in the context of an extensive longitudinal study which covered 10 years during an important transitional developmental phase. Participants were enrolled in our study when they were just entered to high school and were followed until they were close to obtaining a university degree or were active in the labor market. Most of them dropped out from the study simply because they moved in other cities (and we did not have sufficient funds for tracking over the years). Indeed, there was no evidence of systematic attrition.

**Conclusion**

Notwithstanding these limitations, we believe that this study has the potential to offer a significant contribution to literature on the dispositional determinants of prosociality. Our theoretical model can provide a useful framework for understanding how an early focus on self-regulation (i.e., effortful control) and a further focus on resilient strategies, especially during adolescence and the transition to adulthood, might jointly contribute to an increase in prosocial behavior across time. However, the degree and the potential sources of malleability of these constructs deserve further examination in future studies, using appropriate methodologies (such as genetically informed designs) suitable to uncover the degree to which variation in developmental pathways should be considered a function of experience or genetic maturation and their joint contribution.

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**Notes**

1. In calculating (a) zero-order correlations of effortful control with the Big Five and (b) partial correlations of effortful control with ego-resiliency and prosociality, controlling for the Big Five, we excluded from the conscientiousness and emotional stability scales the items from those scales that were used to construct the effortful control measure (see the “Method” section).

2. Because the paths were all constrained to be equal across time, mediated effects estimates and their respective confidence intervals were equal across time (i.e., the indirect effect of effortful control at T1 via ego-resiliency at T2 on prosociality at T3 was equal to that of effortful control at T2 via ego-resiliency at T3 on prosociality at T4, and so on). 3. We tested another model including only self-reported prosociality at T5 and obtained the same results.

**Supplemental Material**

The online supplemental material is available at http://pspb.sagepub.com/supplemental.

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