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## Reciprocal Relations Among Self-Efficacy Beliefs and Prosociality Across Time

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### Abstract

The present study examined the longitudinal relations between individuals' prosociality and their self-efficacy beliefs in regard to emotional regulation and responding empathically to others' needs. The participants were 244 females and 222 males with a mean age of 17 years ( $SD = 1.5$ ) at T1, 19 years ( $SD = 1.4$ ) at T2, and 21 years ( $SD = 1.6$ ) at T3. The findings corroborated the posited paths of relations assigning empathic self-efficacy a major role in predicting the level of individuals' prosociality. Empathic self-efficacy beliefs mediated the relations of regulative emotional self-efficacy beliefs to prosocial tendencies such as caring, sharing, helping, and empathic concern toward others. The posited conceptual model accounted for a significant portion of variance in prosociality and has implications for interventions designed to promote and sustain prosociality.

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Prosocial behaviors refer to voluntary actions undertaken to benefit others. Various prosocial behaviors such as sharing, donating, caring, comforting, and helping are believed to contribute to social relationships and personal mental health in most cultures (Batson, 1998; Eisenberg, Fabes, & Spinrad, 2006; Penner, Dovidio, Piliavin, & Schroeder, 2005). Generous and compassionate behavior also may serve a myriad of individual needs, such as restoring one's self-esteem, enhancing regulation of negative affect, or preserving one's self-image from the injuries of personal failures (Brown & Smart, 1991; Hirschberger, Ein-Dor, & Almakias, 2008; Nadler & Halabi, 2006). Early prosocial tendencies in children appear to be related to children's accomplishments in the academic domain (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Miles & Stipek, 2006; Newman, 1991; Wentzel, McNamara-Barry, & Caldwell 2004) and may contribute to warding off depression (Bandura, Pastorelli, Barbaranelli & Caprara, 1999) and transgressive behavior (Kokko, Tremblay, Lacourse, Nagin, & Vitaro, 2006; Vitaro, Brendgen, Larose, & Tremblay, 2005). Over the life course, prosocial behavior appears to promote social relationships and may foster self-worth and successful psychosocial adaptation, as it sustains others' regard and experiences that nourish positive feelings (Musick, Herzog, & House, 1999; Van Wiligen, 2000).

These adaptive correlates of prosociality have led to a focus on the psychosocial processes and social conditions that regulate and promote prosocial behavior, as well as on individuals' tendencies to consistently behave prosocially across situations. Personal values (such as benevolence and self-transcendence), social norms (such as reciprocity and responsibility), and

situational factors have been found to be repeatedly associated with prosocial behavior (Batson, 1998; Caprara & Steca, 2007; Cialdini, Kallgren, & Reno, 1991; Dovidio & Penner, 2001; Hitlin & Piliavin, 2004; Schroeder, Penner, Dovidio, & Piliavin, 1995).

Numerous researchers assign a major role to individual differences in personality or individual self-regulative processes. Indeed, certain people are more inclined than others to enact behaviors that benefit others and do not hesitate to make the sacrifices that these behaviors may carry. In this regard, developmental psychologists have argued that individual differences in prosocial tendencies reflect maturation and socialization processes as well as cognitive, emotional, and moral development (Eisenberg et al., 2006). A number of authors have pointed to sympathy or empathy as a critical ingredient for other-oriented prosocial behavior and have also noted that both the capacity for perspective taking and emotional control are crucial to effectively meet others' needs (Eisenberg et al., 2006; Hoffman, 2001; Krebs & Van Hesteren, 1994).

Social cognitive theorists have stressed the pervasive role that self-efficacy beliefs exert on personality functioning through their influence on affect, thought, motivation, and action (Bandura, 1997). Unless people believe they attain desired results from their actions, they have little incentive to undertake activities or to persevere in the face of difficulties. Moreover, the self-assurance with which people approach and manage difficult tasks determines whether they make good or poor use of their competencies. A strong sense of personal efficacy overrules insidious self-doubt and sustains the development of both competencies and the regulation of action (Bandura, 1986).

Over the years, the substantial influence of self-efficacy beliefs on individual functioning and behavior and their predictive value has been largely confirmed by several empirical studies, as has their relevance in understanding developmental processes related to very diversified spheres of individual functioning (see Bandura, 1997, for a review). In particular, Caprara (2002) suggested that regulative emotional self-efficacy beliefs (i.e., self-efficacy beliefs in managing negative emotions and in expressing and experiencing positive emotions) and interpersonal self-efficacy beliefs (i.e., social self-efficacy beliefs and empathic self-efficacy beliefs) are important determinants of psychosocial functioning, including prosocial behavior. It is unlikely that people make the sacrifices involved in prosocial behavior unless they believe they are able to both master the emotions associated with the recognition of others' needs and establish the proper context and actions conducive to meet those needs.

Previous work has supported the role of affective self-efficacy, as well as interpersonal self-efficacy beliefs, in sustaining and promoting individuals' tendency to behave prosocially (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Caprara & Steca, 2007; Caprara et al., 1999). These studies showed that empathic self-efficacy beliefs had a stronger direct relation to prosociality than regulative emotional self-efficacy beliefs, whereas regulative emotional self-efficacy beliefs related to prosociality mostly indirectly, through the mediation of interpersonal self-efficacy beliefs (i.e., empathic and social self-efficacy beliefs). However, to our knowledge, no researchers have examined longitudinally the direct and indirect relations among self-efficacy beliefs and prosociality. Such a study is necessary in order to better assess the likely direction of causal influence among variables. Furthermore, although cross-sectional investigations are informative, longitudinal data are necessary to avoid biases in testing mediation and for more exhaustive testing of alternative models (Cole & Maxwell, 2003; Maxwell & Cole, 2007). In this study, utilizing three waves of longitudinal data, we extended previous investigations by implementing a longitudinal research design that allowed for a better test of mediation.

Based on previous findings (Caprara & Steca, 2005, 2007), we posited a model in which the relations of regulative emotional self-efficacy beliefs to prosociality were fully mediated by the confidence in one's capacity to empathize with others, namely empathic self-efficacy beliefs. In posing this model, we relied upon the following considerations.

First, we reasoned that empathic self-efficacy beliefs contribute to the capability and motivation to perform appropriate actions intended to meet others' needs for help, comfort, and support. People are less likely to experience others' distress or need if they feel they are not competent at doing so. Research on empathy-related responses has confirmed the link between such responses and other-oriented behaviors (Batson, 1998; Clark, 1991; Clary & Orenstein, 1991; Eisenberg & Fabes, 1990; Eisenberg & Miller, 1987). This literature is of special interest in light of recent findings attesting to the positive, moderately high correlations between empathic self-efficacy and sympathy and perspective taking (Pastorelli, 2007). Numerous investigators have found that empathy is related (often not strongly) to prosocial responding (i.e., specific voluntary behaviors aimed to benefit others; Davis, 1994; Hoffman, 2001; Staub, 1984), to various positive interpersonal behaviors aimed to alleviating the distress of others (Eisenberg et al., 1994), and to prosociality (i.e., the dispositional tendency to perform behaviors aimed to benefit others; Eisenberg, Carlo, Murphy, & Van Court, 1995; Roberts & Strayer, 1996). In a longitudinal study, self-reported prosocial dispositions at ages 21–22 to 25–26 years are often related to self-reports of empathy and prosociality, even 10 to 16 years earlier (Eisenberg et al., 2002). However, although correlated with empathy and prosociality, empathic self-efficacy is a quite unique knowledge structure conducive to action. Whereas empathy refers to sensitivity to others' feelings, perceived empathic self-efficacy refers to judgments people hold about their capacity to comprehend and experience others' feelings (Bandura, 1986). Whereas prosociality addresses the behavioral locus of the action, empathic self-efficacy beliefs refer to the cognitive belief that one is able to process and experience others' state, which serves as a potential determinant of prosocial action. On the one hand, perceived empathic self-efficacy beliefs rest upon empathic competencies attesting to individuals' capacity to share others' feeling, and, on the other hand, empathic self-efficacy beliefs enhance one's ability to properly meet others' needs and to enact prosocial behavior. Based on these findings, we predicted that empathic self-efficacy beliefs, in comparison to self-efficacy beliefs about managing one's own emotions, would be a more proximal predictor of prosocial behavior across each time point.

Second, we reasoned that it is unlikely that one feels able to empathize with others unless she or he feels able to master her or his own emotions. In the last two decades, researchers have increasingly recognized that an essential part of individual adjustment is the ability to regulate emotional responses and related behaviors in appropriate and adaptive ways (Bridges & Grolnick, 1995; Cicchetti, Ackerman, & Izard, 1995; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Gross, 1999; Kopp, 1982; Larsen & Prizmic, 2004; Parke, 1994; Saarni, 1990). Moreover, dispositional differences in negative and positive emotionality appear to relate to empathy-related responding and prosocial behavior (Carlson & Miller, 1987; Carlson, Ventura, & Miller, 1988; Cialdini, Baumann, & Kenrick, 1981; Cialdini, Kenrick, & Baumann, 1982; Eisenberg et al., 2008; Okun, Shepard, & Eisenberg, 2000). Individuals dispositionally prone to negative emotionality are relatively likely to experience excessively high levels of vicariously induced negative emotion (e.g., Davis, 1994; Eisenberg et al., 1994; Eisenberg, Martin, & Fabes, 1996), which have, in turn, been associated with personal distress (a self-focused, aversive response to the apprehension of another's need or distress; Batson, 1998; Davis, 1994; Eisenberg et al., 1994), a self-focus (Wood, Saltzberg, & Goldsamt, 1990), and low levels of prosocial responding (Eisenberg & Fabes, 1990). Moreover, people prone to personal distress tend to be low in self-regulatory skills (Eisenberg et al., 1994, 1996). In contrast, people prone to experience sympathetic concern in response to others' distress or need appear to be high in the abilities to regulate their attention and behavior (Eisenberg et al.,

1994, 1996; see Eisenberg et al., 2006), although they may also be prone to some types of negative emotions (e.g., sadness; Eisenberg et al., 1994). The ability to manage negative emotions such as anger and despondency 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 & Okun, 1996; Okun et al., 2000).

In contrast, the capacity to express positive emotions is likely to fuel warmth and feelings of sympathy and care (Fredrickson, 2001). Expressing positive feelings such as liking and affection toward others, enthusiasm, enjoyment, and satisfaction after personal accomplishments has been linked to social competence (Denham, 1998; Denham, McKinley, Couchoud, & Holt, 1990; Eisenberg et al., 1993, 1998; Sroufe, Schork, Motti, Lawroski, & LaFreniere, 1984). Furthermore, people experiencing positive affect may be less preoccupied with their own needs and much more available to take care of others (Eisenberg et al., 1994; see Eisenberg et al., 2006; Isen, 1970; Isen, Clark, & Schwartz, 1976). Thus, it is likely that the capacity to express positive affect is related to both caring emotions and behaviors. Moreover, because self-efficacy in managing both positive and negative emotions is assumed to involve self-regulation, we expected, as in previous research, a moderately high correlation between these two aspects of emotional self-efficacy (Bandura et al., 2003; Caprara & Steca, 2005, 2007).

Clearly, there is a conceptual distinction between actually being able to self-regulate and feeling competent to do so. In fact, emotion-related self-regulation refers to "the process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, intensity, or duration of internal feelings, states, emotion-related physiological, attention processes, motivational states and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals" (Eisenberg & Spinrad, 2004, p. 338). Emotional self-efficacy is not identical to emotion-related self-regulation in that it reflects a person's perceived abilities to self-regulate, which may not always reflect entirely their true level of self-regulation. Some individuals may not fully recognize their own competence whereas others overestimate their own abilities. Yet it is unlikely that people can effectively handle positive and negative affect if they do not believe themselves to be capable of doing so (Bandura, 1997).

Ultimately, we expected that perceived emotional self-efficacy beliefs related to management of positive and negative emotions would contribute to prosociality mostly indirectly through empathic self-efficacy beliefs. This expectation is based on the assumption that emotion regulation exerts its influence on prosocial behavior through the capacities needed to properly perform that behavior. If individuals feel capable of handling empathic feelings, they are unlikely to become overwhelmed by them and experience self-focused personal distress rather than sympathetic concern (Batson, 1991). Among behaviorally oriented self-efficacy beliefs, the perceived capability to sense another person's feelings and to respond empathetically to others' distress and misfortune has shown the highest correlation with prosociality (Caprara & Steca, 2005, 2007). Thus, we hypothesized that empathic self-efficacy would fully mediate the relation of emotional self-efficacy to prosociality.

In testing this model, sex differences were not the primary focus of our interest. However, we examined gender differences in all measures of self-efficacy and prosociality. In accordance with previous findings (Bandura et al., 2003; Caprara, Capanna, Steca, & Paciello, 2005; Caprara & Steca, 2005, 2007), we expected women to score higher than men on both regulative emotional (positive and negative) and empathic self-efficacy as well as on prosociality. However, we had no reason to expect any gender differences in the posited relations among these variables. In regard to the stability of our variables during the years under consideration,

in accordance with previous findings (Caprara, 2008; Eisenberg et al., 1995, 2002), we expected moderate to high rank-order stability of prosociality and self-efficacy beliefs for both men and women.

In summary, the primary aim of the present study was to investigate the relations among self-efficacy beliefs related to different domains of emotional functioning (i.e., regulation of negative emotions, appropriate expression of positive emotions, and empathic self-efficacy) and prosociality with a relatively strong test of mediation using longitudinal data (Cole & Maxwell, 2003; Maxwell & Cole, 2007). A conceptual representation of this theoretical model is displayed in Figure 1. As already noted, we tested the hypothesis that the relation of self-efficacy beliefs regarding managing negative affect and in expressing positive affect, namely, regulative emotional self-efficacy beliefs, to prosociality was fully mediated by empathic self-efficacy. In addition, we examined if empathic self-efficacy beliefs predicted prosociality across time, above and beyond its stability.

It also was of interest to investigate the patterns of relations over time among self-efficacy beliefs concerning diverse spheres of individual functioning. Consistent with the aforementioned hypothesis regarding mediated effects, both self-efficacy in managing negative affect and self-efficacy beliefs in expressing positive affect were expected to predict empathic self-efficacy across time (see Caprara, 2002), even when controlling for the stability of the constructs. In contrast, we were less certain of the relations between beliefs about self-efficacy in managing negative affect and in expressing positive affect. For this reason, we investigated the degree of relations among various self-efficacy beliefs (i.e., the cross-lagged paths from one type of emotional self-efficacy belief to the other and indirect relations through empathic self-efficacy beliefs over time). Likewise, we examined the existence of reciprocal paths stemming from empathic self-efficacy beliefs to regulative emotional self-efficacy beliefs over longer periods of time (i.e., across all the time periods covered by the study). It is likely that relations between different kinds of individual self-efficacy beliefs, as well as between emotional and empathic self-efficacy beliefs, are reciprocal, as is emphasized in Bandura's principle of reciprocal determinism (Bandura, 1997).

Third, we did not exclude the possibility that, over time, prosociality contributes to empathic self-efficacy beliefs, as habitual prosocial behavior might contribute over time to empathic self-efficacy by providing the conditions for practicing and further strengthening the abilities that are at the basis of empathic self-efficacy beliefs (Metz & Yourniss, 2003; Staub, 1979; Yourniss, McLellan, & Mazer, 2001). In addition, by engaging in prosocial actions, people may come to think of themselves as prosocial individuals (Cialdini & Goldstein, 2004; Eisenberg, Cialdini, McCreath, & Shell, 1987), because these experiences provide empathic rewards, helping skills, and social approval (see Eisenberg et al., 2006; Staub, 1979). Thus, in the long run, it is likely that the initial engaging in prosocial behavior changes individuals' self-perceptions about their own empathic and prosocial dispositions and capacities (Eisenberg et al., 2006).

## METHOD

### Participants

The participants were 466 older adolescents, 244 females and 222 males, ranging in age from 16 to 18 at Time 1 (henceforth labeled T1; mean age = 17,  $SD = 1.5$ ), from 18 to 20 years at Time 2 (henceforth labeled T2; mean age = 19,  $SD = 1.4$ ), and from 20 to 22 years at Time 3 (henceforth labeled T3; mean age = 21,  $SD = 1.6$ ). Most participants attended high school at T1 and T2 (from 18 to 19 years). At T3, the majority (52.2%) were college students. Participants were from Genzano, a residential community near Rome, and were from families involved in an ongoing longitudinal study in that community. The families of this community represent 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% were retired. The socioeconomic heterogeneity of the sample adds to the generalizability of the findings. The occupational socioeconomic distribution also matched the national profile (Istituto Italiano di Statistica, 2002). In addition, the composition of the families matched national data with regard to type of families and number of children. Most adolescents were from intact families (94.8%) and, on average, from one-child families (about 60% of total sample). The participation rate was fairly high during the longitudinal data collection, with 81% of the original sample returning after 4 years at the final assessment time. Eight percent of participants (49% female) were not assessed at T2, and 11% of participants (42% female) were not assessed at T3. The attrition was mainly due to absence from school at the time of the assessment (at T2), to relocation from the area, or to an inability to contact the participant. Analyses of variance suggested that the attrited participants did not significantly differ from their counterparts on any of the variables in the initial assessment; nor did the groups differ in the covariance matrices as tested by the Box M test for homogeneity of covariance matrices.

## Procedures

The adolescents enrolled in this study were drawn from several high schools. Specifically, all students enrolled in these grades participated in the study unless they happened to be absent from school when the measures were administered. At T1, T2, and T3, parents' and youths' consents, as well as approval from school councils, were obtained. Adolescents were administered a set of scales tapping different types of behaviors in their classrooms by two trained female experimenters and were asked to complete the scales individually. Two female researchers collected the questionnaires with measures of interest for this study as well as other measures during specially scheduled sessions in a school. Before starting, the experimenters explained that participants' responses would be absolutely confidential. When necessary, the experimenters offered clarification regarding the behaviors measured. At T3, when the majority of participants were in college, they were contacted by phone and invited to participate in the study, for which they received a small payment (25 euros [about \$40] or an equivalent dinner token).

## Measures

The measures were all self-report scales and included measures of self-efficacy beliefs in managing negative emotions, self-efficacy beliefs in expressing positive emotions, empathic self-efficacy beliefs, and prosociality administered at each time point.

**Regulative Emotional Self-Efficacy**—Regulative emotional self-efficacy beliefs were measured with two scales assessing the perceived capability to manage negative affect and to express positive affect (Bandura et al., 2003; Caprara & Gerbino, 2001). Eight items measure one's perceived capability to regulate negative affect in the face of anxiety-arousing threats, anger provocation, rejection, and disrespect, and the ability to control worrying or anxiety when things go wrong (e.g., "How well can you keep from getting discouraged by strong criticism?" and "How well can you get over irritation quickly for wrongs you have experienced?";  $\alpha$ s = .84, .84, and .92 at T1, T2, and T3). Six items assess one's perceived capability to express positive affect such as liking and affection toward others, enthusiasm and enjoyment, and satisfaction after personal accomplishments (e.g., "How well can you express joy when good things happen to you?" and "How well can you rejoice over your successes?";  $\alpha$ s at T1, T2, and T3 = .83, .81, and .89, respectively). On each set of items assessing self-efficacy, participants rated the strength of their self-efficacy beliefs on a 5-point scale ranging from 1 (*not well at all*) to 5 (*very well*).

**Empathic Self-Efficacy**—Perceived empathic self-efficacy (Bandura et al., 2003; Caprara, Gerbino, & Delle Fratte, 2001) was rated (1 = *not well at all* to 5 = *not well at all*) with 12 items reflecting one's perceived capability to sense another person's feelings and need for emotional support, to discern emotional expressions, to experience emotions from another person's perspective, to respond empathetically to others' distress and misfortune, and to be sensitive to how one's actions affect others' feelings (e.g., "How well can you experience how a person in trouble feels?" and "How well can you recognize when someone wants comfort and emotional support, even if he/she does not overtly exhibit it?";  $\alpha$ s at T1, T2, and T3 were .90, .89, and .91).

**Prosociality**—Participants rated (1 = *never/almost never true*; 5 = *almost always/always true*) their prosociality on 16 items that assess the degree of their sharing, helping, taking care of others' needs, and empathizing with others' feelings (Caprara, Steca, Zelli, & Capanna, 2005). The psychometric properties of the prosociality scale have been cross-gender and cross-nationally validated on large samples of respondents (Caprara, Tramontano, et al., 2007; e.g., "I try to help others" and "I try to console people who are sad";  $\alpha$ s = .93, .88, and .93 at T1, T2, and T3). Researchers have also found a moderately high correlation (.54) between self- and other-ratings on this prosociality scale, further supporting its validity (Caprara, Steca, et al., 2007). Importantly, because the four items related to empathizing with others' feeling could overlap with measures of empathic self-efficacy beliefs, we used only the 12 items that assess the degree of their sharing, helping, and taking care of others' needs.

**Preliminary Analysis**—To investigate the dimensionality of the latent structures of the various items and to avoid any overlap among the four measures, a principal factor analysis with Promax rotation was performed at each assessment. According to the scree-plot, the three analyses yielded a four-factor structure corresponding to the hypothesized four separate constructs (i.e., three factors corresponding to the three domains of self-efficacy functioning and one factor corresponding to prosociality) at each assessment time. The actual item loadings on the intended factors ranged from .40 to .85 ( $M = .55$ ,  $SD = .10$ ) across the three assessment times, whereas the secondary loadings varied from .01 to .19 ( $M = .10$ ,  $SD = .08$ ) across the three assessment times. Factor correlations ranged from .31 to .59 across the three assessments.

These analyses attest to the factorial validity of all the measures and to the empirical distinctiveness of the four constructs as well as to the lack of empirical overlap among items measuring the different constructs.<sup>1</sup>

## RESULTS

Using one-way analyses of variance (ANOVAs), we first examined sex differences in the measures within each of the three time points. Next we examined the zero-order relations among the variables, both within time and across time. Third, we used structural equation modeling for testing the aforementioned hypotheses. We also examined the potential moderating effects of sex.

<sup>1</sup>We also recomputed correlations between prosociality and empathic self-efficacy beliefs after removing two additional items (i.e., "How well can you recognize when someone wants comfort and emotional support, even if he/she does not overtly exhibit it" and "I try to be close to and take care of those who are in need"). The correlation between prosociality and empathic self-efficacy dropped only slightly (T1 = -.03; T2 = -.01; T3 = -.05). Furthermore, deleting these items has little effect on the reliability of the scale and did not have an influence on the complete structural equation models. Thus, we report the analyses without dropping those two items in order to maintain a sufficient level of construct validity for our measures.

## Descriptive Statistics

Table 1 presents the means and standard deviations for regulative emotional self-efficacy beliefs, empathic self-efficacy beliefs, and prosociality at T1, T2, and T3. One-way ANOVAs indicated that there were significant gender differences for all assessed variables (see Table 1). The same pattern of significant univariate effects held at each assessment: Males reported a stronger sense of efficacy in managing negative affect than females, whereas females felt more efficacious in expressing positive affect and in experiencing empathy and also reported higher scores on prosociality than males.

Table 2 contains the zero-order correlations among regulative emotional self-efficacy, empathic self-efficacy, and prosociality. High correlations across time attest to the high stability of both self-efficacy beliefs and prosociality. As expected, at each assessment the different forms of perceived self-efficacy were positively and highly related to each other. Furthermore, ratings of empathic self-efficacy and prosociality were significantly and positively correlated at each time point for both sexes.

**Relations of Self-Efficacy Beliefs to Prosociality**—For estimating the hypothesized model and for handling missing data, we used the Mplus 4.01 (Muthén & Muthén, 2006) with Full Information Maximum Likelihood (FIML) estimation. This estimator maximizes the number of participants whose data contribute to the covariance matrix between indicators. Compared to other methods of handling missing data, the FIML produces more reliable estimates for parameters and model fit (Enders & Bandalos, 2001). According to a multifaceted approach to the assessment of the model's fit (Tanaka, 1993), the following criteria were employed to evaluate the goodness of fit:  $\chi^2$  likelihood ratio statistic, Tucker and Lewis Index (TLI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) with associated confidence intervals. The significance value of chi-square is sensitive to large sample sizes and easily produces a statistically significant result (Kline, 1998). We accepted TLI and CFI values greater than .95 (Hu & Bentler, 1999) and RMSEA values lower than .05 (Browne & Cudeck, 1993).

To test for possible moderation by sex, we used multiple group structural equation modeling. In this approach, the equivalence between the different groups is evaluated by constraints imposing identical unstandardized estimates for the model's parameters (Muthén & Muthén, 2006).<sup>2</sup> Within the Mplus framework, the plausibility of these equality constraints is examined with the modification indices and the difference test between nested models (i.e., constrained models vs. the baseline unconstrained model). Mediated effects were calculated using the procedures outlined by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002). Furthermore, we followed the asymmetric confidence interval method recommended by MacKinnon et al. (2002) to formally test mediation (MacKinnon, Lockwood, & Williams, 2004). The critical values for the upper and lower confidence limits for indirect effect were calculated on the basis of the product of two random variables from the program PRODCLIN2 (Fritz & MacKinnon, 2007; MacKinnon, Fritz, Williams, & Lockwood, 2007). The composite mean scores on each scale were used as the indicator in subsequent models and all variables included in the model were posited as single indicator latent variables by estimating the error terms from reliabilities (Bollen, 1989). These procedures take into account the effect of the scale's unreliability and contribute to overcome the problem of attenuation in mediational analysis (Bollen, 1989).

<sup>2</sup>As an equality constraint was imposed on unstandardized parameter estimates, standardized parameters could be different across groups. In all figures, we reported separate standardized parameter estimates from the constrained model, one for males and one for females.



## Test of Mediation Over Time

The hypothesized model was analyzed using a multiple group approach. The empirical test showed that the *fully sex-constrained model* (i.e., the model with all paths equated across gender) showed a good fit to the data:  $\chi^2(94) = 115.34, p < .07, CFI = .991, TLI = .988, RMSEA = .031 (.00 - .049)$ . This model is displayed in Figure 2.<sup>3</sup> Following standard procedure, we examined the gain in fit achieved by freely estimating all paths across sex. The change in fit between the *fully constrained versus unconstrained model* was nonsignificant:  $\Delta\chi^2(34) = 15.41, p = 1.00$ , attesting to the plausibility and thus to the tenability of the constraints imposed on the unstandardized parameter estimates in the *constrained model*.

As displayed in Figure 2, all autoregressive paths (i.e., the path predicting a variable from its prior level) were significant. As predicted, both self-efficacy beliefs in managing negative affect and in expressing positive affect at T1 were positively related to T2 empathic self-efficacy beliefs, and T2 empathic self-efficacy beliefs were positively related to T3 prosociality. We examined if the relation between either self-efficacy beliefs in managing negative affect or self-efficacy beliefs in expressing positive affect on prosociality was mediated through empathic self-efficacy beliefs. For self-efficacy beliefs in managing negative affect, the unstandardized indirect effect was significant ( $\beta = .05; z = 2.82$ ), and the associated confidence interval did not include zero (lower confidence limit = .02; upper confidence limit = .08). The same pattern was true for self-efficacy beliefs in expressing positive emotions: The unstandardized indirect effect was significant ( $\beta = .33; z = 2.52$ ), and the associated confidence interval did not include zero (lower confidence limit = .14; upper confidence limit = .56). These results indicate that T2 empathic self-efficacy significantly mediated the relation between T1 regulative emotional self-efficacy beliefs and T3 prosociality.

Looking more closely to the longitudinal relations between empathic self-efficacy beliefs and prosociality, the results showed that these variables may influence the development of each other differently and reciprocally. In particular, the mediational model suggests a pivotal role of empathic self-efficacy in promoting prosociality across near (i.e., 2 years) and distant (i.e., 4 years) time periods. Indeed, empathic self-efficacy significantly predicted prosociality from T1 to T2, from T2 to T3, and from T1 to T3. In contrast, prosociality predicted empathic prosociality only from T2 to T3. More specifically, empathic self-efficacy at T1 predicted prosociality at T2, above and beyond its stability, which subsequently predicted empathic self-efficacy at T3, above and beyond its stability. The unstandardized indirect effect of empathic self-efficacy at T1 on empathic self-efficacy at T3 through prosociality at T2 was significant ( $\beta = .07; z = 3.88$ ), and the associated confidence interval did not include zero (lower confidence limit = .04; upper confidence limit = .10), thus attesting to mediation. This pattern of findings suggests that the causal influence of empathic self-efficacy on prosociality is likely stronger than the reverse pattern of causality, although causal relations may go in both directions and cannot be proved with correlational data (even if longitudinal).

With regard to the longitudinal relations among regulative emotional self-efficacy beliefs, from T1 to T2 neither of the two regulative emotional self-efficacy beliefs (i.e., to do with positive or negative emotions) had a significant direct path to the other. Only T2 self-efficacy beliefs in expressing positive affect significantly predicted T3 self-efficacy beliefs in managing negative affect. Conversely, self-efficacy beliefs in managing negative affect assessed at T1 indirectly and significantly predicted self-efficacy beliefs in expressing positive affect at T3 through their path to T2 empathic self-efficacy beliefs, as demonstrated by a significant

<sup>3</sup>This model include the longitudinal path from empathic self-efficacy at T1 to prosociality at T3, because it was suggested by modification indices.

unstandardized indirect effect ( $\beta = .04$ ;  $z = 2.93$ ) and by the associated confidence interval (lower confidence limit = .02, upper confidence limit = .07).

With regard to the longitudinal relations among empathic self-efficacy beliefs and regulative emotional self-efficacy beliefs, empathic self-efficacy beliefs were significantly predicted by both types of regulative emotional self-efficacy beliefs from T1 to T2 and again from T2 to T3. Moreover, from T2 to T3, empathic self-efficacy partially mediated the development of self-efficacy beliefs for expressing positive emotions. That is, self-efficacy beliefs for expressing positive emotions at T1 predicted empathic self-efficacy at T2, which, in turn, predicted self-efficacy beliefs for expressing positive emotions at T3, above and beyond its stability. The unstandardized indirect effect was significant ( $\beta = .28$ ;  $z = 2.61$ ), and the associated confidence interval did not include zero (lower confidence limit = .13; upper confidence limit = .47).

Finally, the model accounted for a large proportion of variability for all variables, with little or no apparent differences across sexes. For both groups, the percentages of explained variance were, at T2, 16% for self-efficacy beliefs in managing negative affect, 32% for self-efficacy beliefs in expressing positive affect, 37% for empathic self-efficacy beliefs, and 35% for prosociality; at T3, they were 32% for self-efficacy beliefs in managing negative affect, 30% for self-efficacy beliefs in expressing positive affect, 45% for empathic self-efficacy beliefs, and 50% for prosociality.

Although this model provided a good fit to the empirical data, two additional plausible alternative models were also tested. In the first of these models, we hypothesized that prosociality predicted empathic self-efficacy beliefs and both types of regulative emotional self-efficacy beliefs and that empathic self-efficacy beliefs also predicted both types of regulative emotional self-efficacy beliefs. In this model, in addition to paths from prosociality to self-efficacy beliefs and from empathic self-efficacy to regulative emotional self-efficacy beliefs, we allowed the longitudinal paths (a) from each type of regulative emotional self-efficacy beliefs to the other across time (i.e., from self-efficacy beliefs in managing negative affect to self-efficacy beliefs in expressing negative affect and vice versa) and (b) from empathic self-efficacy beliefs to prosociality (and vice versa) across time. We also included a path from empathic self-efficacy T1 to prosociality T3 (because this was indicated by modification indices and was allowed in the original model), as well as all autoregressive paths and within-time correlations among constructs. This alternative model showed a poorer fit to the data than the proposed one,  $\chi^2(85) = 172.153$ ,  $p < .01$ , CFI = .954, TLI = .935, RMSEA = .066 (.052 – .081). In the second model, we hypothesized that both types of regulative emotional self-efficacy beliefs predicted prosociality, and then prosociality predicted empathic self-efficacy beliefs. In addition to those hypothesized paths, as in the previous model, we allowed the longitudinal cross-lagged paths (a) from each to the other type of regulative emotional self-efficacy beliefs, (b) from empathic self-efficacy beliefs to prosociality (and vice versa), and included a path from empathic self-efficacy T1 to prosociality T3 (as mentioned above), all autoregressive paths, and correlations among constructs within time. Again the fit of this model was inadequate,  $\chi^2(95) = 279.491$ ,  $p < .01$ , CFI = .902, TLI = .876, RMSEA = .091 (.079 – .104).

## DISCUSSION

Findings from this longitudinal investigation provide support for the hypothesis that empathic self-efficacy mediates the relation of regulative emotional self-efficacy beliefs to prosociality (Bandura et al., 2003; Caprara & Steca, 2005, 2007). In particular, the results are consistent with the hypothesis that one's perceived efficacy in handling one's own emotions (including the regulation of negative emotions and the expression of the positive ones) influences one's perceived efficacy to empathize with others, which, in turn, influences prosociality. The present

findings represent an important extension of prior works for several reasons. In the past, most studies have included only one assessment and, consequently, could not test the predicted paths across time or optimally test diverse alternative models. As Cole and Maxwell (2003) pointed out, with only one assessment it is extremely difficult to rule out all alternative models and provide insight into the direction of influence between a set of variables. For this reason, considering the recent recommendation by Maxwell and Cole (2007), we used three waves of data controlling for variable continuity over time. Thus, albeit the correlational nature of these data limits firm conclusions about causality, we found strong support for the hypothesis that empathic self-efficacy mediated any influence of regulative emotional self-efficacy beliefs on prosociality and appeared to have a strong impact on prosociality over time. Empathic self-efficacy beliefs predicted prosociality not only across adjacent time points in development (i.e., from T1 to T2 and from T2 to T3) but also across longer periods (i.e., from T1 to T3). These results are important in light of the moderately high stability of prosocial behavior across time. In this regard, it is important to note that all of the detected paths of relations among different constructs held over and above the stability of each variable. Such results strongly support the potential role of emotional regulation in fostering self-efficacy regarding empathizing with others and in indirectly promoting prosocial tendencies (Bandura et al., 2003; Caprara, 2002; Caprara & Steca, 2005, 2007). These findings are also consistent with the view that appropriate empathy responding (i.e., sympathy rather than personal distress) is fostered by the appropriate modulation of emotion (Eisenberg et al., 1994, 1996; Okun et al., 2000). Likewise, these results support the conclusion that empathic self-efficacy beliefs, namely, the confidence in one's capacity to empathize with others, plays a key role in relation to prosociality across short and longer time periods.

As we anticipated, across a period of 4 years, prosociality also significantly predicted empathic self-efficacy. Indeed, from T2 to T3, not only did empathic self-efficacy partially mediate prosociality, but prosociality, in turn, partially mediated change in empathic skills during early adulthood. Together, these two partially mediated relations suggest that, in emerging adulthood, the relations among empathic self-efficacy beliefs and prosociality are dynamic. Increasing empathic skills may not only promote prosociality, but mastering experiences associated with behaving prosocially may also, in the long run, promote empathic skills. The latter pattern of findings is consistent with Staub's (1979) suggestions that children may become more prosocial and may develop stronger prosocial motives through the experience of helping others.

Other important findings of this study came from the analysis of the longitudinal relations among self-efficacy beliefs related to the different domains of affect regulation and empathic capacities. Our results indicate that empathic self-efficacy beliefs may become, over time, a contributor to the development of self-efficacy beliefs in regard to expressing positive emotions. From T1 to T2, empathic self-efficacy beliefs did not predict either self-efficacy beliefs in managing negative emotions or in expressing positive emotions. However, a significant cross-lagged path was found from T2 empathic self-efficacy beliefs to T3 self-efficacy in managing positive emotions. Furthermore, self-efficacy beliefs in expressing positive emotions at T1 indirectly predicted self-efficacy in expressing positive emotions at T3 through T2 empathic self-efficacy. Thus, empathic self-efficacy appeared to mediate the change in self-efficacy in expressing positive emotions during the course of late adolescence/early adulthood. Thus, it appears that, across the developmental period considered, increases in individuals' empathic skills may have promoted self-regulatory abilities as well as vice versa. This fact supports the special role of experiencing positive emotions in broadening attention and in building psychological and social resources (Fredrickson, 2001).

It is noteworthy that the same pattern was not found for self-efficacy beliefs in managing negative affect. Thus, the repeated experience of empathy during late adolescence and early

adulthood seems to promote only the expression of positive affect, not the managing of negative, aversive affective states.

In regard to the pattern of relations between the two types of regulative emotional self-efficacy beliefs, in the longitudinal model we found that self-efficacy in expressing positive emotions at T2 predicted self-efficacy in managing negative affect at T3. Thus, adolescents who are able to express liking and affection toward others, enthusiasm, and enjoyment are more able, 2 years later, to regulate anger, control negative affect, and to deal effectively with social frustration. In contrast, we did not find any direct relations of self-efficacy in managing negative affect to self-efficacy in expressing positive affect, either from T1 to T2 or from T2 to T3. Only an indirect effect was present across time through empathic self-efficacy. Thus, self-regulative abilities may influence one another differently and mostly through mediation by empathic self-efficacy beliefs.

The broaden-and-build theory of emotions (Fredrickson, 2001) can aid in interpreting these results. The focus of this theory is on positive emotions; however, its generalization to the domain of negative emotions has been proposed (Graham, Huang, Clark, & Helgeson, 2008).

More specifically, Graham et al. (2008) found that the appropriate regulation of negative affect appeared to promote interpersonal relations. They suggested that not only the experience of positive emotions but also the narrowing of attentional focus that follows the experience of negative emotions can lead individuals to take corrective actions that promote social relationships. We also speculate that repeated experiences of optimal regulation can lead individuals to perceive themselves as effective in mastering empathic experiences (Bandura, 1997). In turn, these mastering experiences can foster distinct abilities in the domain of self-regulation, building an individual's sense of efficacy and extending his or her beliefs regarding self-competence (Fredrickson, 2001) from one domain (i.e., the expression of positive emotions) to another (i.e., managing of negative emotions). In addition, youths' self-perceived abilities to express positive emotion may increase the likelihood of positive social interactions (e.g., Sroufe et al., 1984), which might contribute to their ability to control negative emotions as well as their self-perceptions in this regard.

From a more general point of view, the best model suggests a pivotal role for empathic self-efficacy beliefs as the major predictor of prosocial behavior across time and as the mediator of relations of regulative emotional self-efficacy beliefs to prosociality. Furthermore, empathic self-efficacy beliefs seem to influence in the development of self-efficacy beliefs about positive and negative emotion differently. The aforementioned findings are of value in regard to designing interventions aimed to induce and enhance prosociality. Self-efficacy beliefs can be gradually instilled, and social cognitive theory provides us with some direction. In particular, self-efficacy beliefs can be fostered through persuasion, modeling, and mastery experiences that are conducive to the development of the abilities upon which particular self-efficacy beliefs pertain (Bandura, 1997). Initial evidence supports the importance of providing youths, parents, and educators with strategies aimed to increase adolescents' competencies in understanding others' needs and recognizing when persons are in trouble and, thus, fostering the development of abilities to empathize and sympathize with others (see Domitrovich, Cortes, & Greenberg, 2007; Feshbach & Feshbach, 1982).

Finally, the gender differences in the present study replicated those in previous research (Caprara, Caprara, & Steca, 2003; Caprara & Steca, 2005, 2007; Eisenberg et al., 2006). At all ages, female adolescents and young adults reported higher self-efficacy beliefs in expressing positive affect, empathic self-efficacy, and prosociality than did their male counterparts. In contrast, males scored high on self-efficacy beliefs about regulating negative emotions. These results are open to different interpretations. Perhaps males and females are differentially

motivated to rate themselves in accordance with the perceived stereotypic gender roles. In fact, Western societies tend to view empathy, higher appropriate expression of positive emotion, expression of internalizing negative emotions such as anxiety, sadness, and depression, and prosociality as feminine traits, whereas the masculine role is often associated with impulsivity and higher level of externalizing emotions such as anger and high intensity positive emotion (see Eisenberg et al., 1996; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). Alternatively, one could argue that, due to gender-role socialization, most females developed relatively high levels of positive interpersonal abilities, such as empathy or prosocial behavior and the modulated expression of positive emotion (Eisenberg et al., 2006; Else-Quest et al., 2006), whereas, consistent with the masculine role, males tended to be high in the ability to manage the expression of negative emotions. In light of the observed across-time consistencies of the gender differences and previous meta-analyses showing a stable difference between males and females in positive emotions, often moderated by the social context (Hall, 1984; Hall & Halberstadt, 1986; LaFrance, Hecht, & Paluck, 2003), we lean toward the latter interpretation (although both might affect the results).

There are potential limitations of this study because of the measures that were used (self-reports) and the population examined. Perceived self-efficacy beliefs are private cognitive states that are necessarily accessible through report by the individuals who hold those beliefs. However, prosociality could be assessed not only through self-report. Researchers have previously found a fair degree of concordance between self-reports of prosociality and others' evaluations of participants' prosociality (Caprara, Steca, et al., 2007). Certainly, in future work it would be desirable to rely upon multiple methods and informants across situations to minimize bias due to self-report and reputation. Moreover, these results need to be corroborated in different samples as well as in different cultural contexts. The desirability of and tendencies to enhance others' well-being may show important variations across social context and cultures (see Eisenberg et al., 2006), as might beliefs about the regulation and expression of emotion (Mesquita & Frijda, 1992). In addition, one cannot exclude the possibility that other situational factors moderate the relations among personality traits, self-efficacy beliefs, and behavior. As we did not use a measure of empathy per se, the value of empathic self-efficacy beliefs above and beyond actual empathy needs to be investigated. Furthermore, in future research, it will be interesting to use, alongside empathic self-efficacy measure, some behavioral measures such those tapping the recognition of emotions in others (Mayer, Caruso, & Salovey, 2000).

Despite these limitations, we believe that there are several practical implications of the obtained relations among self-efficacy beliefs and prosocial behavior. In particular, interventions can be designed to strengthen empathic self-efficacy beliefs through modeling and mastering experiences in accordance with social cognitive theory (Bandura, 1997). Moreover, familial and school practices that foster prosocial behavior (see Eisenberg et al., 2006) may have effects on prosociality through empathic self-efficacy as well as empathic and sympathetic capacities.

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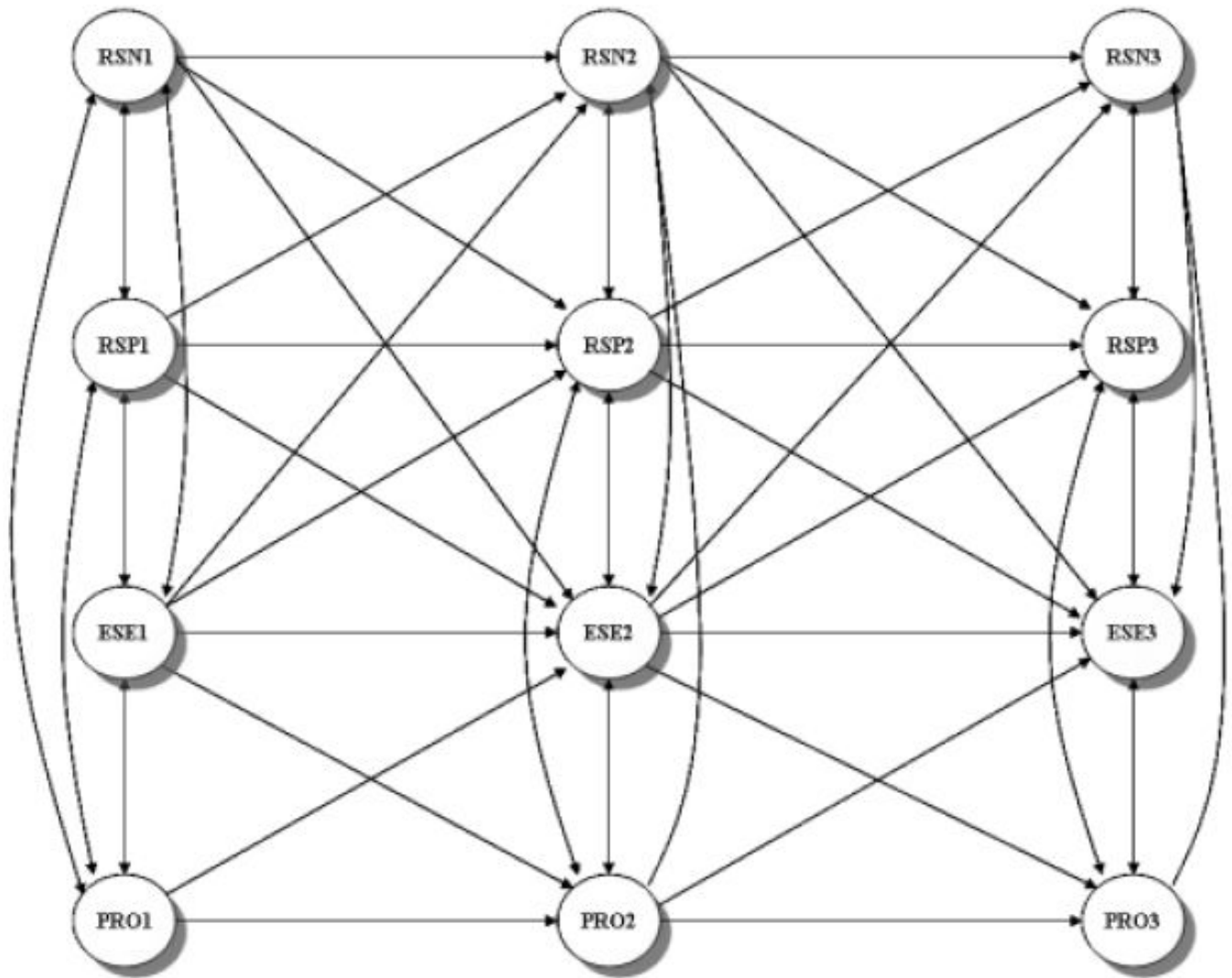
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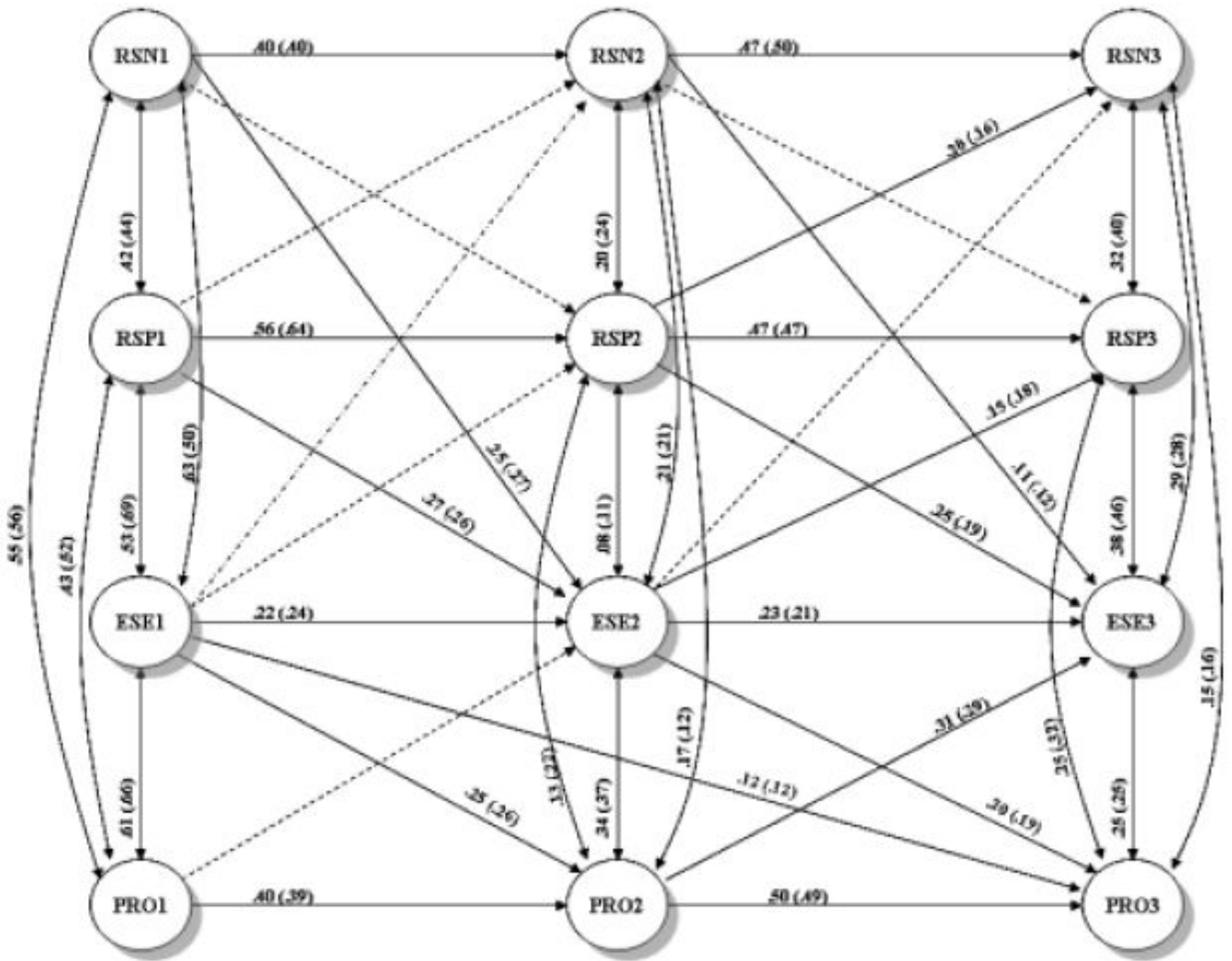


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**Figure 1.** Conceptual model of the paths of influence of Regulative Emotional Self-Efficacy and Empathic Self-Efficacy beliefs on adults' Prosociality assessed at T1, at T2, and at T3. SE = self efficacy beliefs.



**Figure 2.** Longitudinal relations between Regulatory Emotional Self-Efficacy and Empathic Self-Efficacy beliefs on adults' Prosociality assessed at T1, at T2, and at T3 in the *fully sex-constrained model*. SE = self efficacy beliefs. Solid lines represent significant paths, and dotted lines represent nonsignificant paths. Reported coefficients refers to standardized estimates respectively for males and for females (in parentheses). All parameters are significant beyond  $p < .05$ .

Means and Standard Deviations of Regulatory Emotional, Self-Efficacy Beliefs, and Prosocial Behavior at T1, T2 and T3 Among Males and Females

	T1			T2			T3			<i>F</i> (1, 374)	
	Males		Females	Males		Females	Males		Females		
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean		<i>SD</i>
RSN	3.47	0.59	3.22	0.65	3.26	0.60	3.12	0.62	3.03	0.66	30.64**
RSP	4.16	0.59	4.36	0.55	4.07	0.65	4.41	0.50	4.39	0.54	54.44**
ESE	3.78	0.58	3.93	0.57	3.32	0.49	3.62	0.53	3.82	0.55	54.58**
PRO	3.39	0.60	3.76	0.56	3.40	0.65	3.84	0.63	3.89	0.61	73.88**

Note. RSN = regulative emotional self-efficacy to manage negative affect; RSP = regulative emotional self-efficacy to express positive affect; ESE = empathic self-efficacy; PRO = prosociality.

\*  $p < .05$ ,

\*\*  $p < .01$ .

Table 2

Correlation Matrix of the Different Variables for Males and Females

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) RSN (T1)	1.00											
(2) RSP (T1)	.34**	1.00										
(3) ESE (T1)	.35**	.60**	1.00									
(4) PRO (T1)	.43**	.43**	.59**	1.00								
(5) RSN (T2)	.30**	.19**	.23**	.14**	1.00							
(6) RSP (T2)	.26**	.53**	.35**	.31**	.37**	1.00						
(7) ESE (T2)	.41**	.45**	.49**	.30**	.37**	.34**	1.00					
(8) PRO (T2)	.28**	.34**	.47**	.50**	.24**	.38**	.56**	1.00				
(9) RSN (T3)	.30**	.28**	.24**	.24**	.43**	.34**	.20**	.19**	1.00			
(10) RSP (T3)	.20**	.39**	.28**	.30**	.12*	.49**	.30**	.28**	.43**	1.00		
(11) ESE (T3)	.29**	.40**	.46**	.39**	.27**	.45**	.46**	.54**	.50**	.64**	1.00	
(12) PRO (T2)	.34**	.37**	.47**	.40**	.16	.29**	.49**	.60**	.29**	.46**	.62**	1.00

Note. The correlation coefficients below the diagonal are for males; the correlation coefficients above the diagonal are for females. RSN = Regulative emotional self-efficacy to manage negative affect; RSP = Regulative emotional self-efficacy to express positive affect; ESE = Empathic self-efficacy; PRO = Prosociality.

\*  $p < .05$ ,

\*\*  $p < .01$ .