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Regulatory emotional self-efficacy beliefs matter for (mal)adjustment: A meta-analysis

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Abstract

Regulatory emotional self-efficacy beliefs (RESE) in managing negative emotions and in expressing positive emotions are believed to play an important role in different spheres of psychological functioning. However, the literature does not offer a quantitative synthesis of the degree of the relation between RESE and indices of (mal)adjustment. The present study is a meta-analytic investigation of the relation between RESE and indices of maladjustment and adjustment. A total of 93 studies from 83 peer-reviewed international articles and 1 doctoral dissertation were included, for a total amount of 48,373 participants. RESE were negatively and significantly related to *maladjustment* (r = -.24). Conversely, RESE were positively and significantly related to *adjustment* (r = .35). Results seem not to be affected by publication bias and only a few moderating effects were documented. In conclusion, given the above results, RESE proved to be (among others) a valid marker of overall psychosocial functioning, both in its positive and negative facets.

Keywords Regulatory emotional self-efficacy beliefs · Social-cognitive mechanisms · Psychological functioning · Maladjustment · Adjustment

People often reflect upon the impact that future life contingencies will have on themselves. Usually their anticipatory thinking is colored by emotions evoked by the anticipation of the event. Regardless of the emotional valence, when people are faced with emotionally laden events, they often ask themselves, "Will I be able to manage it?". The issue is not solely managing negative affect arising from frustrating or unexpected events. Being social, talkative, and cheerful at social events can be an intimidating challenge for many people. Also, individuals who possess self-regulatory skills might, sometimes, feel unable to rely on them in taxing and perturbing situations. As indicated by a number of empirical studies, a robust sense of regulatory emotional self-efficacy is needed to overcome individuals' perceived emotional obstacles to self-regulative efforts across different domains of functioning (Bandura et al., 2003; Caprara, 2002).

Regulatory emotional self-efficacy beliefs (RESE) capture individuals' perceived ability to manage basic affective states and appear to be associated with individuals' social functioning (Alessandri et al., 2015). Understanding such beliefs is crucial because research suggests that RESE predict important outcomes in different and important life domains, such as work or education (Bandura, 1997; Stajkovic & Luthans, 1998). Moreover, RESE have been shown to predict lower emotional stability scores over time (Caprara et al., 2013a), a very stable personality trait considered a strong predictor of psychological health (Friedman & Kern, 2014). Also, there is corroborating evidence that RESE beliefs provide the basis of other important self-efficacy beliefs, such as social (Caprara & Steca, 2006), empathic (Alessandri et al., 2009), and work-related self-efficacy (Alessandri et al., 2009, 2021). In line with these considerations, the purpose of this study was to synthesize the available data on RESE across different spheres of psychological functioning—an endeavor that assesses a question of

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theoretical interest and also speaks to the validity of operationalizations of RESE.

A theoretical perspective on the value of regulatory emotional self-efficacy beliefs

Self-efficacy beliefs, namely judgements people hold about their capacity to cope effectively with specific challenges and to face demanding situations (Bandura, 1986, 1997), have been shown to be strongly correlated with aspects of thought, motivation, and action (Bandura et al., 2003; Stajkovic, & Luthans, 2003). The reason, supported by empirical studies, is that feeling able to attain a desired goal is a strong incentive to striving to achieve it and to persevere in the face of difficulties (Bandura, 1986, 1997).

Self-efficacy beliefs were originally conceived as reflecting highly contextualized knowledge that affects appraisal processes, which in turn guide actions (Bandura, 1977, 1997). Consequently, scholars frequently have pursued a multifaceted approach to the assessment of self-efficacy by relating them to very specific tasks (see Bandura, 2012). RESE reflect a turning point in the assessment of the construct, in that RESE measures tap a broader level than the task-specific level of beliefs (Caprara, 2002). This change of level is justified by the idea that individuals use self-reflection to evaluate their ability in regard to a variety of tasks relating to "clusters" of interrelated circumstances and situations, and construct a more general set of self-efficacy beliefs related to a specific domain (Caprara, 2002).

The manner and degree to which people regulate their emotions likely depend, in part, on how they appraise their affective experiences (Jamieson et al., 2013; Mauss et al., 2007). A long tradition of studies has suggested that the degree of control individuals believe they have over the causes of their internal emotional states and their emotional reactions determines their self-regulatory strategies (e.g., Bandura, 1986; Lazarus, 1991). Indeed, it is frequently acknowledged that failures in affect regulation give rise to emotional and psychosocial dysfunctions (Bower, 1992; Carstensen, 1992; Gross & Muñoz, 1995; Larsen, 2000; Nolen-Hoeksema, 1991). The notion that affect regulation plays a pivotal role in determining individuals' functioning has been borrowed by social cognitive researchers (Bandura et al., 2003; Caprara, 2002) who have assigned RESE – perceived self-efficacy beliefs to manage these basic affective states – a fundamental role in maladjustment/adjustment (Alessandri et al., 2009, 2015; Caprara, 2002).

RESE assess the control individuals recognize they can exert on their emotional experience, including knowledge of what determines their own emotion (Alessandri et al., 2015; Bandura, 1997; Bandura et al., 2003; Caprara et al., 2008). RESE are expected to influence the regulation of emotion at both the locus of causality (e.g., individuals' appraisal of events from which emotions derive) and the locus of their expression and consequences (Caprara et al., 2008). Furthermore, RESE likely influence the strategies individuals use to deal with emotions (Gunzenhauser et al., 2013).

Following the traditional distinction between positive and negative affect (Russell & Carroll, 1999; Watson & Tellegen, 1985), Caprara et al. (2008) argued for two distinct sets of emotion-related self-efficacy beliefs: One for overruling or modulating the expression of negative affect and a second for appropriately experiencing and expressing positive affect (Alessandri et al., 2015; Bandura et al., 2003; Caprara, 2002). Clearly, normativity or deviance in emotional expression is usually determined by different socioculturally constructed expressive rules (Thoits, 1989). However, individuals who feel they cannot sufficiently regulate their strong negative emotions, if exposed to provocative circumstances and intense stressors, might be expected to express negative feelings such of anger or irritation in ways that might be problematic (Eisenberg et al., 2001; Olson et al., 1999), or overwhelmed by fear, anxiety, or depression (Flett et al., 1996). Moreover, there is empirical evidence suggesting that daily social situations often are fueled by people's ability to express positive emotions (Manstead & Fischer, 2000; Shiota et al., 2004). In general, positive affect fosters social bonding and connectedness (Lyubomirsky et al., 2005). Positive affect also enhances cognitive functioning, counteracts the upsetting effects of negative experiences, and enables adaptive coping (Folkman & Moskowitz, 2000; Fredrickson, 1998; Isen, et al., 1987). High self-efficacy in expressing positive emotions likely indirectly fuels prosocial tendencies in youths (Alessandri et al., 2009; Caprara & Steca, 2006) by promoting higher perceived empathic competence, and it is also correlated with life satisfaction in different phases of life (Caprara & Steca, 2005b). Consistent with the aforementioned arguments, there is evidence that experimentally induced negative affect lowers self-efficacy beliefs pertaining to interpersonal spheres of functioning, whereas the induction of positive affect enhances perceived self-efficacy (Kavanagh & Bower, 1985). In social contexts, high RESE in regard to managing negative emotions indirectly predict different forms of prosocial tendencies among youths (Alessandri et al., 2009; Caprara & Steca, 2006; Caprara et al., 2012) and tenured workers (Alessandri et al., 2021).

There is also evidence that RESE are important determinants of the expression of negative affect. In the case of binge eating, for example, it has been shown that negative affect precipitates binge eating in bulimics reporting low

RESE, but infrequently does so for those bulimics with high perceived RESE (Love et al., 1985; Schneider et al., 1987). When coping with threats, individuals high in perceived self-efficacy perform intimidating activities successfully despite anxiety arousal (Bandura, 1997; Pajares & Valiante, 1997; Williams, 1995). Others studies support the conclusion that the stronger RESE in managing negative emotions are, the stronger is the engagement in different kinds of activities (Bandura, 1997; Kavanagh & Bower, 1985). Finally, there is further evidence that regulatory emotional self-efficacy beliefs in managing negative emotions could prevent stress and burnout by mediating the association between emotional stability (a trait capturing high negative affect) and burnout (Alessandri et al., 2018).

Differences between regulatory emotional self-efficacy beliefs and other constructs

Measures of Emotional Intelligence (EI) often are viewed as including an evaluation of RESE (Siegling et al., 2015). However, as conceived in the EI tradition, emotional self-efficacy beliefs equate to people's perception of their emotional abilities (see Siegling et al., 2015). For example, Mayer and Salovey (1997) defined EI as a capacity to reason about emotions and to use emotions to enhance thinking. Accordingly, it stands to reason that individuals with high scores on EI measures are expected to be able to be effective in emotion regulation (Mayer & Salovey, 1997). In contrast, RESE are conceived as malleable cognitive structures (a set of beliefs, in the sense of Bandura, 1986) that are different from a personality trait or from a standard emotional competence measure (see Caprara, 2002). In brief, RESE are defined as an individual's beliefs about being able to manage specific kinds of emotions (and thus not a measure of any actual competence; Caprara et al., 2008), whereas EI is concerned with actual competence (Siegling et al., 2015).

Another construct with which RESE share similarities is that of effortful self-regulation (Derryberry & Rothbart, 1997), namely "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). However, RESE tap feelings of competence in the emotion regulation domain, not individuals' actual abilities to self-regulate. A person's perceived ability to self-regulate may not always completely reflect their actual self-regulation given that some individuals might not be able to realistically evaluate (i.e., one may exaggerate or under-evaluate) their own self-regulatory competence.

Finally, given that emotional self-efficacy beliefs entail a subjective evaluation of one's own emotional competence in the domain of emotion regulation, measures of regulatory emotional self-efficacy beliefs are expected to relate moderately to measures of positive and negative states (and they actually are correlated in the range of about 0.30; see Caprara et al., 2008). These moderately low correlations are expected, given that the perception of one's own abilities is substantively different from the assessment of one's own emotional state.

The present meta-analysis

The literature reviewed so far underscores the relevance of RESE, their specificity compared to related conceptualizations (such as emotional intelligence and effortful self-regulation), and their importance for (mal)adjustment. However, despite the large body of evidence that has been accumulated so far, the findings have remained scattered across different subdomains (e.g., Bandura et al., 2003; Mesurado et al., 2018), have been obtained using different instruments (Alessandri et al., 2009; Choi et al., 2013; Galla & Wood, 2012) or with different versions of the same instrument (Caprara et al, 2010b; García et al., 2017; Zani & Cicognani, 2006), using different research design (e.g., Alessandri et al., 2021; Gunzenhauser et al., 2013), and in different cultural contexts (Caprara et al., 2008; Choi et al., 2013; Gunzenhauser et al., 2013; Mesurado et al., 2018). One attempt to synthetize evidence and weigh the value of the construct relied on narrative methods (i.e., Alessandri et al., 2015) that preclude any quantitative inference. Meta-analytic methods are ideally suited to robustly quantify the validity of RESE as a predictor of (mal)adjustment by aggregating the evidence across a large number of studies.

Thus, the goal of this study was to synthesize the available data on the relation of RESE to maladjustment and adjustment. We used the terms maladjustment/adjustment in the sense suggested by Kraus et al. (2005), namely as indicators of an individual's subjective sense of distress and ability, or inability, to function in daily life, including pathological symptoms, wellbeing, and general functioning. Maladjustment and adjustment are terms that cannot simply be reduced to being the inverse of one another (Ryff et al., 2006). In fact, building upon the seminal World Health Organization's (WHO) definition of health as "not the mere absence of diseases, but a state of well-being", theoretical advances indicate that maladjustment and adjustment are two separate continua (Keyes, 2002) and understanding both is of utmost importance for developing effective interventions (e.g., Fava & Ruini, 2014).

Accordingly, we grouped the studies in two clusters and computed separate meta-analyses for each. The first cluster, the *maladjustment* cluster, included those studies reporting results on the association of RESE with measures of *behavioral maladjustment* and *negative emotions*. *Behavioral maladjustment* included those behaviors that do not conform to the social norms, that are not functional for one's and others' well-being, and that denote personal instability (e.g., Shonk & Cicchetti, 2001). Hence, this grouping included measures assessing, for example, antisocial behaviors (e.g., delinquency), externalizing behaviors, and risky behaviors (e.g., alcohol consumption). Finally, *negative emotions* referred to measures capturing affective states related to anger, despondency, sadness, and other negative affective experiences (Caprara et al., 2008; Watson & Pennebaker, 1989).

The second cluster, the *adjustment* cluster, included indicators of *behavioral adjustment*, *emotional adjustment*, *health and cognitive well-being*, and *positive emotions*. The term *behavioral adjustment* refers to those behaviors that conform to the social norms, that are functional for one's own and others' well-being, and that denote personal stability (e.g., DeRosier et al., 1994). Hence, under this label, we included scales assessing, for example, prosocial behaviors, positive personality traits (e.g., agreeableness, conscientiousness, and extraversion), interpersonal efficacy, and ego-resilience. *Emotional adjustment* refers to an individual's capability to regulate and manage his/her emotions (DeRosier et al., 1994), including measures of emotion regulation and emotional (in)stability. As indicators of *health and cognitive well-being*, we considered measures related to life satisfaction, physical symptoms, general health, mental health, optimism, and openness. Finally, *positive emotions* refer to happiness, joy, satisfaction, and other indicators of positive affective experiences.

We hypothesized that RESE would be negatively related to measures of psychological maladjustment and positively related to measures of psychological adjustment. We also examined a number of factors that could moderate the strength of the associations between RESE and indicators of maladjustment and adjustment. The moderator analyses provide information about the robustness of the findings and, potentially, about factors that explain heterogeneity in the relation of RESE to indices of (mal)adjustment.

Analysis of potential moderators

We examined two broad groups of moderators: Sample and study design moderators. These moderators have been selected because they have been considered in previous studies, sometimes resulting in contradictory results. *Sample moderators* included gender composition, mean age, cultural context, and the nature of the sample (i.e., students, patients, etc.). We speculated that emotional expression could differ for individuals belonging to the general population and healthy samples (such as university students), versus individuals with clinical symptoms or "at risk" (i.e., children in orphanage; Eftekhari et al., 2009). Specifically, we expected RESE to be less relevant for "at risk" individuals because of their potentially impaired ability to accurately report on their emotion regulation abilities. In addition, well-documented differences regarding emotional expression across cultures, led us to hypothesize that the values of RESE could vary across languages and countries (Kitayama et al., 2000; Mesquita, 2001; Thoits, 1989). Specifically, we expected predictive coefficients to be higher for samples from more individual-cantered western cultures than for samples from more collectivistic cultures.

Age is another factor that may potentially impact RESE, mostly because of changes in emotional functioning across adulthood (Bleidorn et al., In press). Previous studies that tested RESE associations with age resulted in null results (e.g., Alessandri et al., 2009; Caprara & Steca, 2005a, 2005b; Caprara et al., 2008), but it is important to examine this issue for the larger literature.

Study design moderators included variables related to the operationalization of RESE (i.e., measure used, number of items), as well as publication year. These moderators were examined in an exploratory fashion to assess whether study results regarding the associations between RESE and (mal)adjustment were replicated using different measures (e.g., Alessandri et al., 2018; Caprara et al., 2013a, 2013b, for the general population) or with different versions of the same measure (Alessandri et al., 2009; Bandura et al., 2003) differing in length (e.g., Caprara & Steca, 2006, 14 items; Gerbino et al., 2018, 4 items).

Method

Eligibility criteria

Studies were considered eligible when (a) the study contained at least one zero-order correlation between a measure of RESE and an indicator of (mal)adjustment, and (b) RESE were not manipulated, either experimentally or through an intervention. We excluded all studies reporting data on measures of RESE derived from an instrument designed to assess emotional intelligence because the focus of these measures was on actual emotional competence (Mayer & Salovey, 1997), rather than on individuals' beliefs about the ability to manage specific types of emotions (see Alessandri et al., 2015). Peer-reviewed journal articles, as well as doctoral dissertations (for grey literature), were considered to identify eligible studies by means of bibliographic databases. This is in accordance with suggestions for avoiding selection bias and providing a transparent and replicable plan (Ferguson & Brannick, 2012; for similar applications, see e.g., Crocetti et al., 2021; Orth et al., 2018). We also searched for unpublished data by consulting several conference programs and solicited primary authors in the field for unpublished data or manuscripts (but no additional data emerged from this phase). No restriction on language and year of publication was applied.

Literature search

The literature search was conducted on February 12, 2020, with an update on October 1, 2020. In order to identify (in a systematic way) journal articles and dissertations, four search strategies were used. First of all, we searched in different bibliographic databases: PsycArticles, PsycINFO, ERIC, Scopus, Web of Science, ProQuest Dissertations & Theses, and Google Scholar. The combination of keywords used in each database was "emot* self-efficacy" OR "regulat* self-efficacy" OR "affect* self-efficacy".

Second, in order to retrieve recent eligible studies from publications not yet available in databases (i.e., articles published online first, or articles published in the last issues), the websites of journals that are more likely to publish articles about RESE were checked. In doing so, we used the statistics provided by the previous search we ran in Web of Science. The screened websites were those of *Assessment*, *Developmental Psychology*, *European Journal of Personality*, *European Journal of Psychological Assessment*, *Journal of Adolescence*, *Journal of Adolescent Health*, *Journal of Personality and Social Psychology*, *Journal of Personality*, *Journal of Research in Personality*, *Journal of Research on Adolescence*, *Journal of Youth and Adolescence*, *Personality and Individual Differences*, *and Psychological Assessment*.

Third, a backward search (i.e., the screening of the references in a manuscript) was conducted on two relevant articles, namely (a) a narrative review of RESE (Alessandri et al., 2015), and (b) a key publication in which the RESE scale was tested in three countries and prior research with other instruments was reviewed (Caprara et al., 2008).

Fourth, at the end of the selection process, a further backward search was conducted for all the selected publications.

Selection of studies

The PRISMA (Moher et al., 2009) diagram reported in Fig. 1 displays results of the literature search. A total of 1,446 records were identified, then 639 duplicates were removed leaving 807 records. The latter were screened by two independent raters (the second and third authors), who checked their titles and abstracts. After this phase, 706 records were excluded because they were inconsistent with the aims of the meta-analysis, thus leaving 101 records to inspect in the subsequent phase. The percentage of agreement was excellent (99.10%; Cohen's Kappa = 0.95). The few remaining discrepancies were solved with a third rater (the first author), who independently evaluated the records, and then a final decision was reached through a discussion involving all three evaluators.

Then the 101 records previously selected and their full-texts were evaluated for eligibility by two independent raters (the second and the third authors). Agreement was high (92.38%; Cohen's Kappa = 0.91). Using the same procedure as before, disagreements were resolved with a third rater (the first author). In total, 17 papers were excluded because they did not report correlations between study variables (see Fig. 1). Hence, 84 records were retained for the meta-analysis.

Coding of primary studies

Relevant study information was coded according to a coding protocol consisting of four sections (Cohen's Kappa = 0.83). The second author and third author completed the coding and inter-rater reliability (final inter-rater reliability > 99%) was established by resolving all dubious cases by discussion and then arriving at a final, consensual, decision.

In the first section of the coding protocol, several characteristics of the publication were extracted, such as the type of publication (i.e., whether a journal article or dissertation), year of publication, language of publication (e.g., English, Italian), and journal name. For descriptive purposes, and although not considered in any further analysis, for those reports published in journals indexed in Journal Citation Reports (JCR), four additional pieces of JCR information were coded: Subject category (e.g., "Psychology, social"), Quartile in the Psychology category (Q1, Q2, Q3, or Q4; according to Crocetti et al. [2021] "when a journal was indexed in more than one subject category, the one with the best ranking was chosen" [p. 6]), and impact factor (based on the year in which the article was published). The second section of the coding protocol pertained to sample characteristics: Sample size, gender composition (i.e., percentage of males in the sample), age (i.e., mean and standard deviation), sample description (i.e. clinical/at risk or non-clinical), and country in which the study was conducted. The third section included characteristics of the study design: Instrument used to assess emotional self-efficacy (i.e., Regulatory Emotional Self-Efficacy [RESE] scale developed by Caprara et al., 2008, *vs* other instruments) and number of items. The fourth (and last) section included data necessary for the computation of effect sizes (i.e., Pearson's correlations between emotional self-efficacy and indicators of maladjustment and/or adjustment). When a study was longitudinal, correlations from baseline data were extracted.

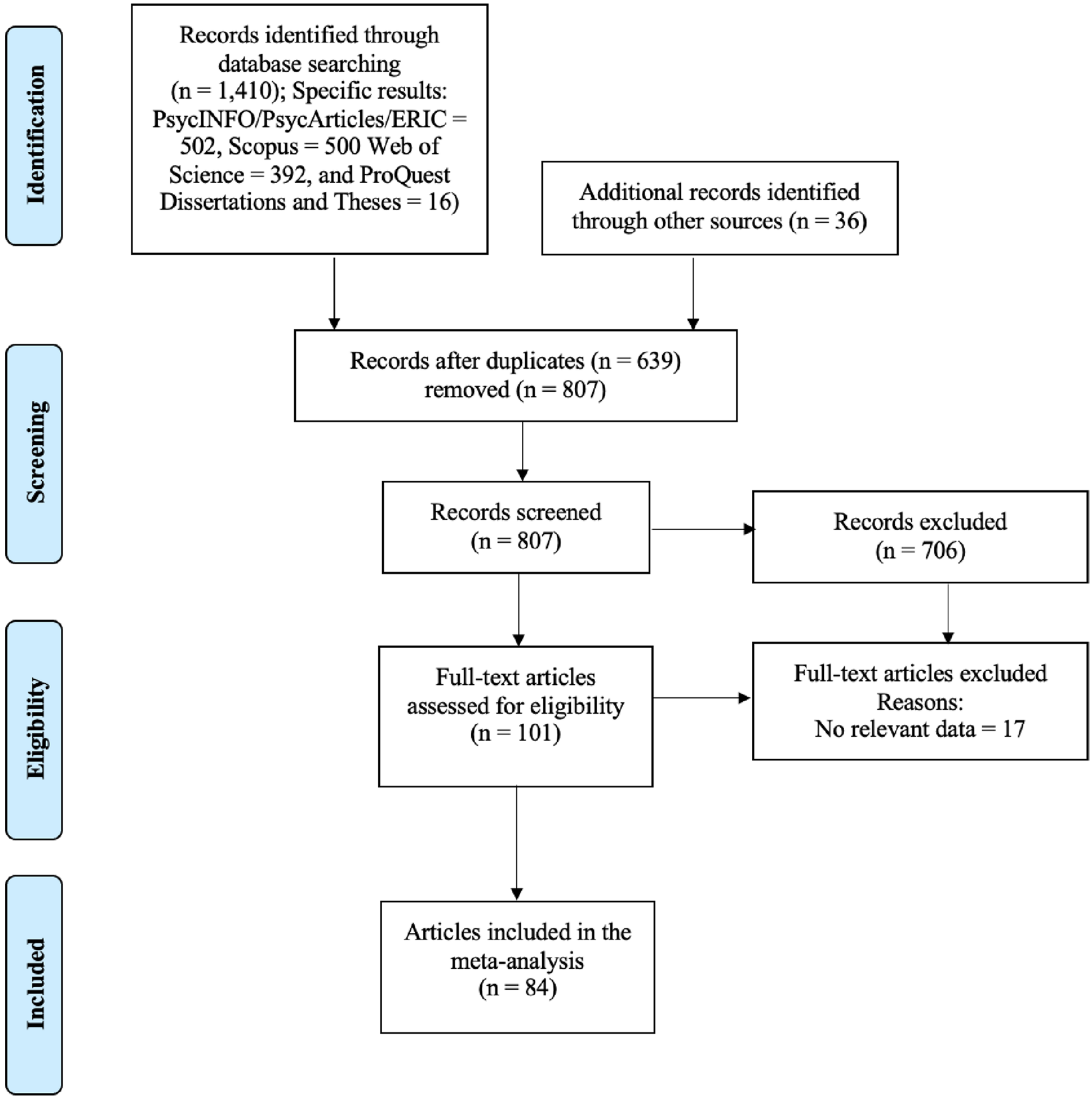

Fig. 1 PRISMA flow diagram

Strategy of analysis

The Statistical Package for the Social Sciences (SPSS) was used to store all the information extracted from primary studies. First, descriptive analyses were conducted to provide an overview of the available literature. Then, analyses were performed with the meta-analytic software ProMeta 3. Pearson's correlations were used to examine the associations between RESE and indicators of maladjustment and adjustment. Pearson's correlations were converted into Fisher's *Z*-scores and then converted back into correlations for presentation (Lipsey & Wilson, 2001). According to common criteria (Cohen, 1988; Ellis, 2010), correlations of |.10|, |.30|, and |.50| are considered small, medium, and large effect sizes, respectively. For each effect size, we computed its 95% confidence interval, standard error, variance, and statistical significance.

Second, correlations across studies were combined by means of the inverse-variance method (Borenstein et al., 2009), and the random-effect model was used to account for different sources of variation among studies and to allow for generalization of the meta-analytic findings (Hedges & Vevea, 1998).

Third, an assessment of heterogeneity across studies was conducted by means of (a) the Q statistic to test if studies' dispersion was due to random sampling error (as indicated by a non-significant Q-value) or to real differences (as denoted by a significant Q-value); (b) the T^2 index to quantify the variance of the true effect; and (c) the I^2 index to estimate the proportion of the observed variance reflecting differences in true effect sizes (values of 25%, 50%, and 75%, indicate a low, moderate, and high heterogeneity; Higgins et al., 2003). Finally, we computed prediction intervals using the adjusted formula proposed by Borenstein et al. (2017). Large prediction intervals indicate that the true effect varies widely from one study to the next. Thus, prediction intervals are indices of dispersion (in contrast to confidence intervals, which are indices of precision).

Moderator analyses were used to identify which factors might explain heterogeneity across studies (Viechtbauer, 2007). *Categorical moderators* (i.e., geographical context of the study; type of sample; instrument used to assess emotional self-efficacy) were tested using subgroup analyses, while *continuous moderators* (i.e., percentage of males in the sample; mean age of the sample; number of items in the scales used to assess emotional self-efficacy; and publication year) were tested by means of meta-regressions. Moderator analyses were conducted when at least four studies for each level of the moderator (in the case of subgroup analyses) or for each moderator (in the case of meta-regressions) were available (Crocetti, 2016).

Finally, we performed multiple publication bias analyses (Rothstein et al., 2005). First, the funnel plot (i.e., a scatter plot of the effect sizes estimated from individual studies against a measure of their precision) was examined. If bias is absent, the plot is symmetrical and inverted funnel-shaped. Second, the asymmetry of the funnel plot was statistically tested by means of the Egger's regression method (Egger et al., 1997): Nonsignificant results are indicative of absence of publication bias. Third, the trim-and-fill procedure was applied. This is an iterative non-parametric statistical technique aimed at evaluating the effect of potential data censoring the result of the meta-analyses (Duval & Tweedie, 2000). Absence of publication bias is indicated either (a) by zero trimmed studies or (b) by trivial differences between the observed and the estimated effect sizes, when there is the presence of trimmed studies (Duval, 2005). If the above methods are consistent in indicating that the impact of publication bias is minimal or absent, then the meta-analytic findings can be considered trustworthy.

Results

Overview of the studies included in the meta-analysis

A total of 84 reports (83 articles published in peer-reviewed journals and one doctoral dissertation) were included in the meta-analysis. Most references were published in the last decade (between 2010 and 2020), with a sharp increase in the years between 2012 and 2018, in which 75% of the publications appeared. With regard to the *characteristics of the publication* (see Supplementary Materials, Table S1), most reports (74 out of 84) were published in English, whereas four (Caprara et al., 2002; Grazzani et al., 2015; Tramontano et al., 2007; Zani & Cicognani, 2006) were published in Italian, three (Li et al., 2013; Yang & Liu, 2016; Zhao et al., 2017) in Chinese, two (García et al., 2017; Urquiola & Bravo, 2016) in Spanish, and one (Çelikkaleli & Kaya, 2016) in Turkish. Most reports (56 out of 84) were published in journals indexed in JCR and, of those, the majority was associated with psychological subject categories (75%), with "Social psychology" (28.6%) and "Multidisciplinary psychology" (17.9%) being the most represented ones. In regard to the journals' ranking, 26.8% of the journals in which the selected articles were published are ranked in the first quartile of their subject category (Q1), 44.6% in the second quartile (Q2), 17.9% in the third quartile (Q3), and 10.7% in the fourth quartile (Q4). The average impact factor was 1.93 ($SD = 1.31$; range 0.22 – 6.93).

Among the selected 84 reports, six (Choi et al., 2013; Gunzenhauser et al., 2013; Nocentini et al, 2013; Steca et al, 2009; Suldo & Shaffer, 2007; Ullrich-French & Cole, 2018) reported two eligible studies and two (Gerbino et al., 2018; Michael & Zidan, 2018) reported information from multiple samples (American, Italian, and Spanish samples in Gerbino et al., 2018; hard of hearing students and typical hearing students in Michael & Zidan, 2018). As a result, a total of 93 independent samples were included in the meta-analysis. Information about *participants' characteristics* is reported in Table 1. The total number of participants was 48,373 ($M = 520.14$, $SD = 536.00$, range 27–3,257). Many samples were gender-balanced (the average percentage of males across samples was 44.75%; range 0%-100%) and the average age of sample participants was 23.56 years ($SD = 12.46$, range: 8.40–65.76 years). With regard to the context of the studies, most studies were conducted in Europe (41.30%), of which 71.05% were in Italy, 7.89% in Spain, 7.89% in Germany, 7.89% in United Kingdom, 2.63% in Greece, and 2.63% in multiple countries. Other samples were from Asia (20.65%), the Middle East (18.48%), North America (15.22%), South

Table 1 Characteristics of studies included in the systematic review

Study (year)	*N*	% males	Age *M* (SD)	Country	Sample description	Measure (n. item)[a]
Adilogullari & Senel, 2014	256	na	na	Turkey	Non clinical	Other (32)
Alessandri et al., 2009	466	47.64	17 (1.5)	Italy	Non clinical	RESE (14)
Alessandri et al., 2018	416	68.3	22.86 (2.29)	Italy	Non clinical	RESE (8)
Arslan, 2017	232	52	12.8 (na)	Turkey	Non clinical	Other (27)
Arslan, 2018	301	51	13 (0.7)	Turkey	Non clinical	Other (27)
Aydogdu et al., 2017	331	26.6	21.46 (3.48)	Turkey	Non clinical	Other (32)
Bandura et al., 2003	464	45.91	16 (na)	Italy	Non clinical	RESE (14)
Bassi et al., 2018	199	38.69	16.74 (1.1)	Italy	Non clinical	RESE (12)
Bertoni et al., 2015	89	na	na	Italy	Clinical/at risk	RESE (15)
Calia et al., 2015	43	na	53 (na)	Italy	Clinical/at risk	RESE (14)
Caprara & Steca, 2005a	683	49.78	50.1 (3.2)	Italy	Non clinical	RESE (17)
Caprara & Steca, 2005b	512	50.59	50.34 (4.8)	Italy	Non clinical	RESE (17)
Caprara & Steca, 2006	347	49.86	50.25 (na)	Italy	Non clinical	RESE (14)
Caprara et al., 2002	592	49.32	16.64 (na)	Italy	Non clinical	RESE (17)
Caprara et al., 2006	664	48.49	16.73 (1.17)	Italy	Non clinical	RESE (15)
Caprara et al, 2008	2,470	48.54	18.72 (0.9)	USA/Italy/Bolivia	Non clinical	RESE (14)
Caprara et al., 2010a	195	47	19 (na)	Italy	Non clinical	RESE (12)
Caprara et al, 2010b	452	49.78	15.83 (0.78)	Italy	Non clinical	RESE (12)
Caprara et al., 2013a	198	49.5	15 (na)	Italy	Non clinical	RESE (14)
Caprara et al., 2013b	206	47	16 (na)	Italy	Non clinical	RESE (14)
Çelikkaleli & Kaya, 2016	346	43.35	20.57 (1.77)	Turkey	Non clinical	Other (8)
Chen et al., 2015	608	3.95	16.47 (0.92)	China	Non clinical	RESE (12)
Chen et al., 2020	654	45.6	13.8 (1.38)	China	Non clinical	RESE (12)
Choi et al., 2013 (Study 1)	704	51	21 (na)	USA	Non clinical	Other (24)
Choi et al., 2013 (Study 2)	321	72	22 (na)	South Korea	Non clinical	Other (24)
Dacre Pool & Qualter, 2012	1,085	37.14	23 (5 years, 10 months)	England	Non clinical	Other (32)
Dacre Pool & Qualter, 2013	306	45.75	28 (7)	England	Non clinical	Other (27)
Demirtaş, 2020	392	51	15 (na)	Turkey	Non clinical	Other (7)
Deng et al., 2017	155	na	na	China	Non clinical	Other (4)
Dogan et al., 2013	340	32.1	20.6 (na)	Turkey	Non clinical	Other (32)
Dou et al., 2016	1,108	49.37	14.65 (1.72)	China	Non clinical	RESE (17)
Emeriau-Farges et al., 2019	990	68.79	na	Canada	Non clinical	Other (41)
Fida et al., 2014	1,147	46.5	40 (11)	Italy	Non clinical	RESE (na)
Galla & Wood, 2012	139	48	8.4 (18.4)	USA	Non clinical	Other (8)
García et al., 2017	53	84.9	39.9 (9.2)	Spain	Clinical/at risk	RESE (10)
Gerbino et al., 2018 (Sample 1)	499	44.29	19.05 (1.54)	USA	Non clinical	Other (4)
Gerbino et al., 2018 (Sample 2)	363	21.21	20.43 (0.95)	Italy	Non clinical	Other (4)
Gerbino et al., 2018 (Sample 3)	223	56.50	26.78 (3.98)	Spain	Non clinical	Other (4)
Ghezzi, 2015	870	33.7	21.84 (4.65)	Italy	Non clinical	RESE (7)
Goerdeler et al., 2015	423	11.8	40.42 (11.94)	Germany	Non clinical	Other (3)
Goroshit & Hen, 2014	273	33	36 (11)	Israel	Non clinical	Other (32)
Goroshit & Hen, 2016	543	22	40.6 (11.1)	Israel	Non clinical	Other (32)
Grazzani et al., 2015	252	48.81	12.6 (4.01)	Italy	Non clinical	RESE (8)
Gunzenhauser et al., 2013 (Study 1)	499	38.48	21.44 (1.46)	Germany	Non clinical	RESE (12)
Gunzenhauser et al., 2013 (Study 2)	264	45.46	38 (5.43)	Germany	Non clinical	RESE (12)
Habibi et al., 2014	946	50	16.5 (na)	Iran	Non clinical	Other (21)
Han et al., 2005	352	0	49.7 (10.7)	USA	Clinical/at risk	Other (15)
Hen & Goroshit, 2016	312	29	40.6 (11.1)	Israel	Non clinical	Other (32)

Table 1 (continued)

Study (year)	*N*	% males	Age *M* (SD)	Country	Sample description	Measure (n. item)[a]
Hoyt et al., 2013	66	100	65.76 (9.04)	USA	Clinical/at risk	Other (15)
Kim et al., 2017	334	54	15.5 (1.41)	South Korea	Clinical/at risk	Other (8)
Kirk et al., 2008	207	35.75	38.42 (14.44)	Australia	Non clinical	Other (32)
Kokkinos & Kipritsi, 2012	206	46.1	11.5 (na)	Greece	Non clinical	Other (24)
Li et al., 2013	777	55.47	na	China	Non clinical	RESE (12)
Lightsey et al., 2011	191	na	24.06 (8.88)	USA	Non clinical	RESE (12)
Lightsey et al., 2013	213	na	na	USA	Non clinical	RESE (12)
Liu & Du, 2014	1,317	47.76	na	China	Non clinical	RESE (12)
Liu et al., 2020	2,716	53.2	13.19 (0.52)	China	Non clinical	RESE (12)
Loeb et al., 2016	817	20.81	43.2 (10.35)	Sweden/Germany	Non clinical	Other (8)
Lv et al., 2018	1,998	52.25	29.51 (3.2)	China	Non clinical	Other (24)
Mesurado et al., 2018	417	46.04	14.7 (0.68)	Spain	Non clinical	RESE (12)
Michael & Zidan, 2018 (Sample 1)	27	62.96	12.59 (1.37)	Israel	Clinical/at risk	Other (8)
Michael & Zidan, 2018 (Sample 2)	27	62.96	12.59 (1.37)	Israel	Non clinical	Other (8)
Milioni et al., 2015	450	46.89	17 (0.81)	Italy	Non clinical	RESE (9)
Niditch & Varela, 2012	124	37	14.82 (1.71)	USA	Non clinical	Other (21)
Nocentini et al., 2013 (Study 1)	470	52.55	19.1 (1.3)	Italy	Non clinical	RESE (4)
Nocentini et al., 2013 (Study 2)	124	50	20.96 (2.05)	Italy	Non clinical	RESE (4)
Owen et al., 2006	71	28.2	56.3 (10.7)	USA	Clinical/at risk	Other (15)
Paciello et al., 2016	870	33.7	21.7 (4.46)	Italy	Non clinical	RESE (7)
Pan et al., 2016	763	48.36	12.79 (0.75)	China	Non clinical	RESE (12)
Shi & Zhao, 2014	225	36	19.84 (1.25)	China	Non clinical	Other (42)
Steca et al., 2009 (Study 1)	462	43.72	19.28 (1.08)	Italy	Non clinical	RESE (14)
Steca et al., 2009 (Study 2)	307	43.97	20.3 (2.02)	Bolivia	Non clinical	RESE (14)
Suldo & Shaffer, 2007 (Study 1)	685	36	14.79 (1.82)	USA	Non clinical	Other (21)
Suldo & Shaffer, 2007 (Study 2)	318	32	16.13 (1.18)	USA	Non clinical	Other (21)
Tariq et al., 2013	175	47	20.4 (5.1)	England	Non clinical	Other (32)
Tommasi et al., 2018	179	74.4	16.97 (1.49)	Italy	Non clinical	RESE (15)
Totan & Sahin, 2015	228	45.6	20.5 (na)	Turkey	Non clinical	Other (30)
Totan et al., 2013	334	31.43	20.5 (na)	Turkey	Non clinical	Other (32)
Totan, 2014	303	40.6	20.88 (1.63)	Turkey	Non clinical	RESE (12) and Other (32)
Tramontano et al., 2007	537	43.20	19.65 (1.5)	Italy	Non clinical	RESE (17)
Ullrich-French & Cole, 2018 (Study 1)	140	0	8.76 (0.9)	USA	Non clinical	Other (na)
Ullrich-French & Cole, 2018 (Study 2)	249	na	9.07 (1.01)	USA	Non clinical	Other (na)
Urquiola & Bravo, 2016	55	100	na	Bolivia	Non clinical	RESE (34)
Wu et al, 2016	674	34.7	19.38 (0.88)	China	Non clinical	Other (13)
Yang & Liu, 2016	416	na	na	China	Non clinical	RESE (12)
Yap & Baharudin, 2016	802	45	16 (na)	Malaysia	Non clinical	Other (7)
Younesi et al., 2014	320	26.56	na	Iran	Non clinical	Other (32)
Yuan et al., 2018	431	41.5	14.75 (1.02)	China	Non clinical	Other (12)
Zani & Cicognani, 2006	1,130	45.4	na	Italy	Non clinical	RESE (8)
Zeng et al., 2018	3,257	45.8	25.79 (4.5)	China	Non clinical	RESE (17)
Zhao & Shi, 2018	438	29.22	na	China	Non clinical	Other (42)
Zhao et al., 2017	757	48.1	16.42 (1.08)	China	Non clinical	RESE (17)
Zou et al., 2019	483	45.8	36.67 (12.41)	na	Non clinical	Other (12)

na = not available. [a]RESE = Regulatory Emotional Self-Efficacy scale (Caprara & Gerbino, 2001; Caprara et al., 2008)

Table 2 Summary of meta-analytic results, heterogeneity statistics, publication bias analyses for the associations between RESE and mal-(adjustment)

Outcomes	Summary statistics				Heterogeneity				Assessment of publication bias	
	k	N	r	[95% CI]	Q	T^2	I^2	Prediction interval[a]	Trim and fill (n of trimmed studies; estimated r, 95% CI)	Egger's test
Maladjustment	52	32,238	-.24***	[-0.27, -0.21]	558.67***	0.01	90.87	[-0.44, -0.02]	0	0.21
Adjustment	82	40,939	.35***	[0.33, 0.37]	641.20***	0.01	87.37	[0.16, 0.51]	0	0.55

k = number of studies; N = total number of participants; r = Pearson's correlation; CI = confidence interval. Q = statistic used in heterogeneity test; T^2 = between-study variance I^2 = percent of the observed variance reflects differences in true effect sizes, rather than sampling error. [a] Prediction intervals were computed with the adjusted formula provided by Borenstein et al., (2017, p. 17). $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

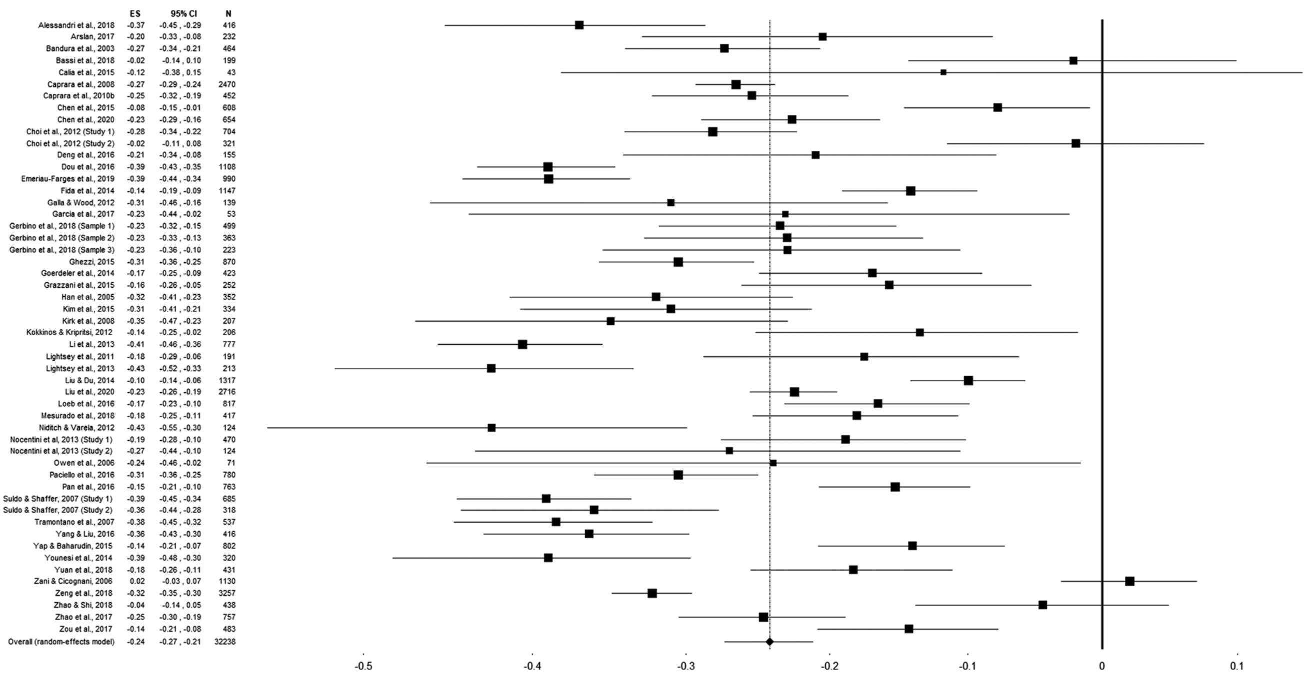

Fig. 2 Forest plot of the associations between RESE and maladjustment. *Notes*. In the forest plot, the squares represent the effect sizes for each study; the horizontal lines represent the confidence intervals; the dimension of the squares is proportional to the study weight; the diamonds represent the overall effect size estimated with a random-effects model

America (2.17%), Oceania (1.09%), and multiple continents (1.09%). Most samples (91.4%) were non-clinical samples, whereas the remaining (8.6%) were either clinical groups or at risk (e.g. cancer treatment patients, orphanage children).

In terms of the *study design* (Table 1), in almost half of the studies (48.4%), the RESE scale (Caprara & Gerbino, 2001; Caprara et al., 2008) or a modified version of it was used to measure RESE, with the remaining 50.5% of the studies using various other instruments to assess it and one study (1.1%; Totan, 2014) employing both the RESE and another instrument. The average number of items used to assess participants' RESE was 16.91 (SD = 9.68; range: 3–42).

Meta-analysis of the association between RESE and maladjustment

The correlation between RESE and *maladjustment* (Table 2), obtained from combining the results of 52 independent samples (Fig. 2) involving a total of 32,238 participants, was small-to-medium (r = -0.24, $p < 0.001$), characterized by significant heterogeneity across studies, and not affected by publication bias, as indicated by the funnel plot (see Supplementary Materials, Figure S1) and the results of the Egger's test and the trim and fill procedure (Table 2). Moderator analyses indicated that, within categorical variables (Table 3), only the country in which

Table 3 Results of moderator analyses: subgroup analyses

	Summary statistics				Heterogeneity				Moderating effects	
Moderators	k	N	r	[95% CI]	Q	T^2	I^2	Prediction interval[a]	Q^b	p
Maladjustment										
Instrument									0.03	.866
RESE	28	22,601	-.24***	[-0.28, -0.20]	401.39***	0.01	93.27	[-0.45, -0.01]		
Other	24	9,637	-.25***	[-0.29, -0.20]	157.28***	0.01	85.38	[-0.45, -0.01]		
Country									13.55	.003
Europe	20	9,386	-.21***	[-0.26, -0.16]	172.66***	0.01	89.00	[-0.44, 0.04]		
Asia	16	14,854	-.22***	[-0.28, -0.16]	254.64***	0.01	94.11	[-0.45, 0.04]		
North America	11	4,286	-.33***	[-0.38, -0.28]	31.76***	0.00	68.52	[-0.47, -0.17]		
Sample									1.95	.163
Non-clinical	47	31,385	-.24***	[-0.27, -0.21]	553.59***	0.01	91.69	[-0.44, -0.02]		
Clinical/at risk	5	853	-.29***	[-0.35, -0.23]	2.79	0.00	0.00	[-0.38, -0.19]		
Adjustment										
Instrument									2.22	.136
RESE	39	22,341	.33***	[0.30, 0.36]	268.04***	0.01	85.82	[0.16, 0.48]		
Other	42	18,295	.36***	[0.33, 0.40]	343.98***	0.01	88.08	[0.14, 0.55]		
Country									25.34	.000
Europe	36	16,164	.32***	[0.29, 0.35]	218.37***	0.01	83.97	[0.14, 0.47]		
Asia	13	11,426	.33***	[0.28, 0.38]	123.38***	0.01	90.27	[0.13, 0.51]		
Middle East	16	5,279	.46***	[0.42, 0.51]	89.30***	0.01	83.20	[0.23, 0.64]		
North America	12	4,546	.31***	[0.25, 0.37]	56.71***	0.01	80.60	[0.09, 0.50]		
Sample									17.15	.000
Non-clinical	76	40,309	.35***	[0.33, 0.38]	616.42***	0.01	87.83	[0.17, 0.52]		
Clinical/at risk	6	630	.18***	[0.10, 0.26]	5.49	0.00	8.91	[0.03, 0.33]		

k = number of studies; N = total number of participants; r = Pearson's correlation; CI = confidence interval. Q = statistic used in heterogeneity test; T^2 = between-study variance I^2 = percent of the observed variance reflects differences in true effect sizes, rather than sampling error. [a] Prediction intervals were computed with the adjusted formula provided by Borenstein et al., (2017, p. 17). Q^b = contrast between subset of studies. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 4 Results of moderator analyses: meta-regressions

	% Males				Age				Number of scale items				Publication year			
	k	I	B	p	k	I	B	p	k	I	B	p	k	I	B	p
Maladjustment	47	-0.22	-.00	.651	43	-0.26	.00	.566	51	-0.22	-.00	.234	52	-9.09	.00	.278
Adjustment	75	0.38	-.00	.792	72	0.38	-.00	.439	79	0.29	.00	.006	82	1.84	-.00	.823

k = number of studies; I = intercept; B = slope

the studies were carried out had a significant moderating effect (Q (2) = 13.55, $p < 0.01$) on the results. Specifically, the correlations found in the three geographical area considered suggested that the correlation for studies conducted in North America (r = -0.33) was larger than the correlations obtained in research conducted in Europe and Asia (rs = -0.21 and -0.22 respectively). No significant moderating effects were found for continuous variables (Table 4).

Meta-analysis of the association between emotional self-efficacy and adjustment

The correlation between RESE and *adjustment*, obtained by combining the results of 82 independent samples

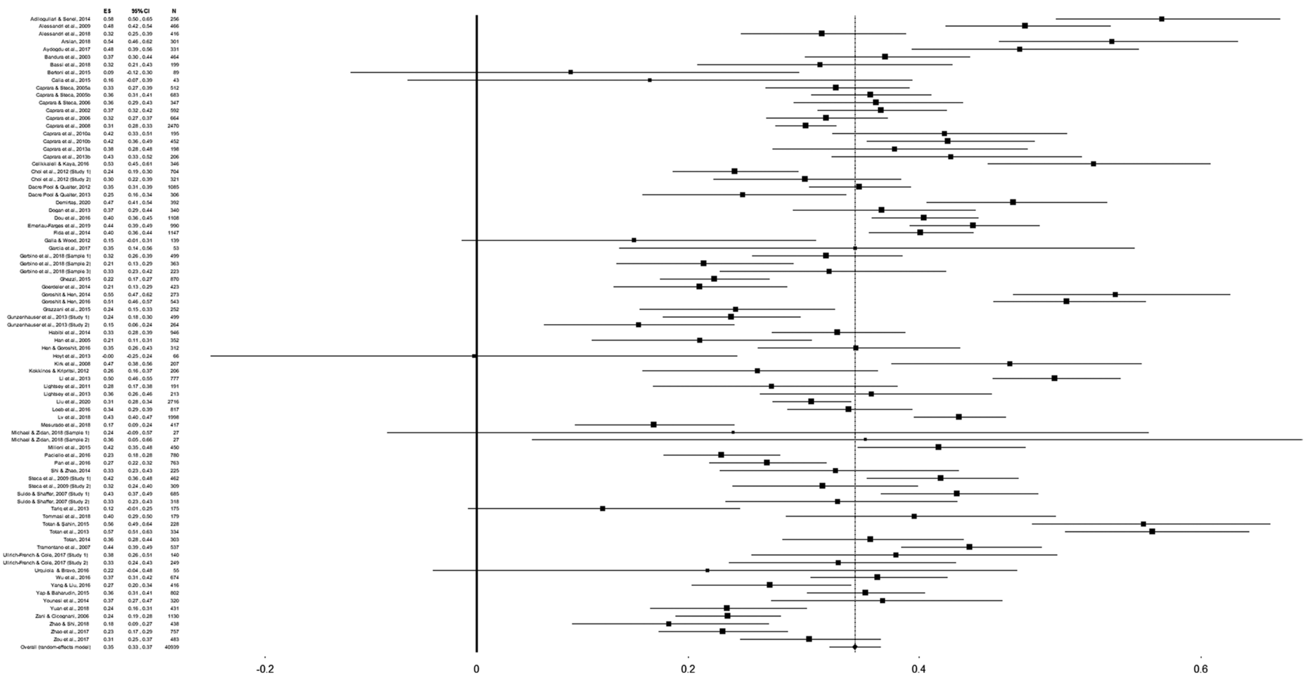

Fig. 3 Forest plot of the associations between emotional self-efficacy and overall adjustment. *Notes*. In the forest plot, the squares represent the effect sizes for each study; the horizontal lines represent the confidence intervals; the dimension of the squares is proportional to the study weight; the diamonds represent the overall effect size estimated with a random-effects model

(Table 2 and Fig. 3) involving a total of 40,939 participants, was medium ($r = 0.35$, $p < 0.001$), characterized by significant heterogeneity across studies, and not affected by publication bias, as indicated by the funnel plot (see Supplementary Materials, Figure S3) and the results of the Egger's test and the trim and fill procedure (Table 2).[1] Moderator analyses indicated that, within categorical variables (Table 3), the country in which the studies were conducted (Q (2) = 25.34, $p < 0.001$) and the type of sample (Q (1) = 17.15, $p < 0.001$) had significant moderating effects on the results. Specifically, the correlation obtained in studies conducted in Middle East ($r = 0.46$) was larger than the correlations obtained in research conducted in Europe, Asia, and North America ($rs = 0.32$, 0.33, and 0.31, respectively), although all correlations were significant. The effect for nonclinical samples was medium ($r = 0.35$), whereas it was smaller (but significant) for clinical/at risk samples ($r = 0.18$). As for continuous variables (Table 4), only the number of items used had a significant effect on results ($k = 79$, I = 0.29, $B = 0.00$, $p < 0.01$). Stronger positive associations between emotional self-efficacy and adjustment were found in studies employing scales with a higher number of items.

Sensitivity analyses

Two sensitivity analyses were conducted to check the robustness of results. First, we looked for potential outliers (i.e., effect sizes with standardized residuals higher than |2|). In the meta-analysis on maladjustment, only one study (Zani & Cicognani, 2006) had a significant residual. This was a study published in Italian in which the effect size was found to be close to zero ($r = 0.02$, $p = 0.434$).

In the meta-analysis on adjustment, eight studies had a significant residual. Two of them (Hoyt et al., 2013; Tariq et al., 2013) deviated from the overall effect size because they reported a non-significant association close to zero or very small; in contrast, the other six studies (Adilogullari & Senel, 2014; Arslan, 2018; Çelikkaleli & Kaya, 2016; Goroshit & Hen, 2014; Totan et al., 2013; Totan & Sahin,

[1] Given the large heterogeneity, a reviewer suggested to investigate publication bias also by means of the weight-function model proposed by Vevea and Hedges (1995). In this approach, the *unadjusted model* (i.e., the original meta-analytic model) is compared to an *adjusted for publication bias model*; then, a likelihood-ratio test compares the two models (a significant p value indicates concerns with publication bias). We used the "weightfunct" function of the "weightr" R package (Coburn & Vevea, 2016). We used as p-value cutpoints "0.025, 0.050, 0.500, 1" for adjustment model, and ".500, .950, .975, 1" for maladjustment model (differences are due to the negative sign of the effect size in the second model). Results showed that both models were not statistically different than their relative *adjusted for publication model* (for adjustment model, $\chi^2(3) = 6.248$, $p = .100$, and for maladjustment model, $\chi^2(3) = 1.415$, $p = .702$).

2015), most of them conducted in Turkey, reported a strong association, with correlations ranging from 0.53 to 0.58. In both cases, the meta-analytic results did not change when recalculating the effect sizes without the studies identified as outliers (i.e., in the meta-analysis on maladjustment the overall effect size remained the same after excluding one study; in the meta-analysis on adjustment the overall effect size computed without the eight outliers was 0.33 instead of 0.35). Given the stability of meta-analytic findings, we chose the conservative approach of not excluding potential outliers from the analyses.

Second, we checked whether the results regarding the associations between RESE and overall maladjustment/adjustment were replicated when considering specific dimensions of the two broad clusters. For maladjustment, the results (see Supplementary Materials, Table S2) indicated the associations of RESE with behavioral maladjustment and negative emotions were both significant but they were small (r=-0.15) and medium (r=-0.29), respectively. For adjustment, the significant association detected when considering the overall index was largely replicated when considering specific dimensions of behavioral adjustment (r=0.36), emotional adjustment (r=0.35), health and cognitive well-being (r=*0.31*), and positive emotions (r=0.36). Overall, this evidence underscores the robustness of the association between RESE and (mal)adjustment.

Third, to check the incremental validity of RESE above-and-beyond measures of positive and negative affect, we conducted ancillary analyses on a subset of studies that included RESE, a measure of positive or negative affect, and an additional indicator of adjustment (it was not possible to conduct the same analyses for maladjustment as there were not enough studies on this). The meta-analytic results (see Supplementary Materials, Table S2), showed that both positive and negative affect were significantly related to adjustment and explained 8% of the variance in it. After including in the models also RESE, the portion of explained variance doubled (up to 16% in the model controlling for positive affect and up to 17% in the model controlling for negative affect), and the association between RESE and adjustment was not only significant but also substantially stronger than the one involving positive/negative affect. This evidence suggests the incremental validity of RESE over and above related constructs of positive and negative affect.

Discussion

The current meta-analysis provided a comprehensive review of extant studies examining the associations of RESE with indicators of both maladjustment and adjustment. From a set of 84 reports, reporting 93 independent samples involving almost 50,000 participants, we found that RESE were significantly negatively related to overall maladjustment and significantly positively related to overall adjustment. Only a few moderating effects were documented, pointing to important cultural, clinical, and methodological considerations, as discussed below.

Emotional self-efficacy matters for adaptation

The findings clearly suggest that emotional self-efficacy matters for adaptation: Emotional self-efficacy was negatively related to maladjustment and it was positively related to overall adjustment. By extrapolation, these results suggest that it may be productive to target regulatory emotional self-efficacy beliefs in interventions designed to improve individuals' subjective well-being and adaptation (van Zyl & Rothmann, 2019). Indeed, it is likely that increasing individuals' perceived competence in the area of negative emotion management and positive emotion expression could lead to an improvement in subjective feelings of adaption, although this point should be further addressed in studies using experimental designs.

Importantly, none of the meta-analytic results was affected by publication bias, as documented by the convergent results of multiple methods we used to assess it (funnel plots, Eggers' test, Trim and Fill procedure; Duval, 2005; Egger et al., 1997; Rothstein et al., 2005). Furthermore, all the confidence intervals were statistically significant and all, except for one, prediction intervals were significant, too. This means that if we need to predict the correlation for any one population (randomly sampled from the same universe as those included in the meta-analysis), we would predict that it would be significant and we would be correct in 95% of the cases (Borenstein et al., 2017).

Having corroborated the value of RESE as a construct associated with psychological well-functioning, our study suggests the need of furthering our understanding of the mechanisms linking self-perceived emotional regulation abilities with actual self-regulation competencies. There is a paucity of studies in the literature addressing this issue, and previous reviews only partially addressed this question (see Bandura, 1997). We strongly believe that theoretical speculation is of no help in this case; the answer can be obtained only with well-designed empirical studies.

The remaining lingering question is how much of the significant association of RESE with psychological (mal) adjustment is driven by an individual's actual self-regulatory ability (naturally tapped by RESE), and how much is, instead, uniquely driven by the individual's beliefs regarding one's own self-regulatory capacities. This point is important because it has the potential to change the target of the intervention. If actual competencies are simply reflected in individuals' RESE levels, then RESE represent an index of self-regulation ability. Also, RESE can be considered an important target in interventions based on enhancing self-regulation strategies. These points cannot be answered in a single study; they are best addressed by meta-analytic analyses once sufficient studies are available. Providing responses to these questions is important both from an applied and a theoretical point of view.

Explaining heterogeneity across studies: insights from moderating analyses

The findings highlighted significant heterogeneity across studies. Significant moderating effects pointed to cultural, clinical, and methodological considerations, as further discussed below. In contrast, we did not find any significant moderating effect for age and years of publication, thus supporting the robustness of the effect of RESE on (mal)adjustment across different age groups and cohorts.

Cultural differences

It is worth emphasizing that the studies included in the current meta-analysis were conducted in a large array of cultural contexts, including Europe, Asia, Middle East, North America, South America, Oceania, and multiple continents. This is remarkable, given the common concern that psychological studies often cannot count on such broad coverage (Arnett, 2008). Building upon this diverse distribution of studies, we found that the geographical area in which the studies were conducted was a significant moderator. For maladjustment, associations were small-to-medium in studies conducted in Europe and Asia and medium in studies conducted in Middle East, North America, and Oceania. For adjustment, the stronger associations were found in Middle East (cf. also results of sensitivity analyses). It is noteworthy, however, that the tested association was significant in all groups of countries examined.

The above results suggest that the relative importance of the construct of RESE may change depending on cultural values. However, it is not easy to completely explain the geographical differences in correlations. From one perspective, this result seems to follow the common distinction between collectivistic and individualistic cultures. However, the comparability of middle-east with North America is puzzling (although likely explained by the nature of the middle east countries involved: Israel and Turkey). Alternatively, it is likely that this moderation simply reflects similarities in the nature of the samples involved. Future cross-cultural studies could be designed to disentangle the meaning of this result.

A clinical focus

Although most studies (91.4%) were conducted with non-clinical samples, we found some differences with the clinical/at risk groups. Specifically, the associations between RESE and adjustment were significantly stronger in the non-clinical than in the clinical/at-risk sample. This is not surprising given that the measures were constructed with nonclinical groups and that RESE has been used more in the general population (Caprara & Steca, 2005b). More in general, these results may reflect an impaired ability of "at risk" individuals in regard to accurately reporting on their self-regulation abilities. Thus, it seems important to evaluate the validity of RESE scales in clinical and at-risk populations in future studies, and eventually consider revising items to make it more suitable for clinical and at-risk samples, if necessary.

Methodological characteristics of the measures

About half of the studies included in meta-analysis employed the RESE Scale (Caprara & Gerbino, 2001; Caprara et al., 2008) or a modified version of it to measure emotional self-efficacy, whereas the other studies used various other instruments. However, the scale used to measure emotional self-efficacy (i.e., the commonly used scales constructed by Caprara versus other scales) did not moderate any result. In contrast, meta-regressions indicated a moderating effect due to number of study items on the measure of RESE for overall adjustment: This correlation was stronger when more items were used to assess RESE. These results can be useful in future research designed to refine existing instruments of RESE. At present, the results support the superiority of longer measures of RESE that are likely to offer broader construct coverage and higher reliability than shorter instruments (reliability is partly a function of items number).

Limitations and suggestions for future research

This study represents the first comprehensive synthesis of the available empirical studies examining the association of RESE with maladaptive and adaptive functioning, two key areas of functioning that have great relevance to theory and practice. Our data, however, have two potential limitations. First, our exclusive focus on correlations prevents any firm conclusion regarding causality. Loosely speaking, correlation does not mean causation, and thus it is not possible to rule out the possibility that some of the effects are in the direction opposite (i.e., from a construct to RESE) to that hypothesized (from RESE to adjustment/maladjustment). To solve this issue, future meta-analyses can consider a focus on longitudinal correlations that provide information potentially useful to shed light on this point.

Furthermore, we noticed that empirical data on experimental interventions designed to improve RESE are limited. Empirical interventions, if designed as quasi-experimental study, offer the opportunity to manipulate RESE in a group, and then observe the effect of the intervention on a related outcome while observing what happens in the control group. Obtaining causal information regarding the impact on RESE on important areas of functioning seems essential to further advance research on self-efficacy. In addition, future studies could go further and investigate the relations between RESE and other related outcomes, such as, for example, measures of emotional intelligence, and if RESE accounts for additional variance in adjustment above and beyond other measures such as those of emotional intelligence.

Conclusions

There is a lot of work to be done before the value and the contribution of RESE to emotion regulation can be understood more fully. However, this meta-analysis suggests that the construct has considerable potential to understanding individual differences in (mal)adjustment. We hope the present meta-analysis motivates further work that expands and improves our knowledge of the functioning of self-efficacy beliefs in the area of emotion regulation, as well as in regard to mechanisms at the basis of social-cognitive theory in general.

Data availability

All meta-analytic data are available in the manuscript.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12144-022-04099-3.

Declarations

Informed consent No informed consent to declare.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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