Graduate thesis

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The Emotion Regulation Checklist - Factor Form Invariance and Acquiescence in Norway

Graduate thesis in Clinical Psychology
Supervisor: Lars Wichstrøm
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Preface

I consider myself fortunate for the opportunity to combine my interests in psychometrics and developmental psychology by analysing data from such a comprehensive source of data as the Trondheim Early Secure Study (TESS). And I am very grateful that my supervisors, Lars Wichstrøm and Odin Hjemdal, welcomed my aspiration to make a small contribute towards the validation of psychological measurements for the use in Norway. Together, we formulated the research questions and the analytical strategy. In order to investigate respondents' levels of acquiescence, the material was supplemented by questionnaire evaluations by six experts within the field of developmental psychology. Data analysis were conducted by me, under skilful guidance by Lars Wichstrøm.

Firstly, I would like to thank Lars Wichstrøm for his availability, positivity and patience, as well as his invaluable suggestions and feedback. I cannot imagine writing this thesis without his outstanding expertise. Thanks to Odin Hjemdal and Silje Steinsbekk for pointing me in the right direction early in the process. I also wish to expand sincere gratitude to all the participants and the field-experts for their valuable contribute to research and for making this thesis possible.

To friends and family, you have provided highly appreciated breaks and encouragement. Mom, your patience, optimism and help with my two children has been invaluable. You have been a great support, as you always are.

Last, but certainly far from least, I am grateful to my husband, Oddbjørn, for his continues support and understanding. You have held our family together during the many hours I have spent on my computer. Between having a second child, buying a house, moving, renovating, him getting a new job and me writing this thesis, it has been a crazy year and a half. I could not have asked for a better partner in life!

Sandnes, September 2019

Sara Wathne Oseland

Abstract

The primary purpose of this study was to examine the validity of the Norwegian version of the Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997). Parent and teacher responses were collected from a community sample of Norwegian children at four timepoints (*n*= 605-783). Main analyses were confirmatory and exploratory factor analysis, as well as an indicator of acquiescence response style. The results indicated that the latent structure of the Norwegian version of the ERC differed from the two-factor structure suggested by the original authors. Post-hoc analysis failed to identify meaningful model-alterations, and explorative analysis did not succeed to reveal alternative solutions with acceptable fit and interpretability. In addition, both scales in the original two-factor solution seemed to be contaminated by parents' acquiescence. As so, the validity of the Norwegian version of the ERC was not supported, and its use in Norway should be carefully considered due to interpretation difficulties and validity issues.

The Emotion Regulation Checklist - Factor Form Invariance and Acquiescence in Norway

Emotion regulation is believed to play a fundamental role in affective, social and cognitive development, as well as diverse forms of psychopathology (e.g; Campos, Mumme, Kermoian, & Campos, 1994; Denham et al., 2010; Gross, 2014a; Kim-Spoon, Cicchetti, & Rogosch, 2013; Thompson, 1994; Vingerhoets, Nyklícek, & Denollet, 2008). In addition, it offers an integrated view of how and why emotion organize or facilitate other psychological processes (Gross, Salovey, Rosenberg, & Fredrickson, 1998). Thus, studying the concept of emotion regulation promises to contribute to our understanding of both typical and atypical development (Cole, Michel, & Teti, 1994; Gross, 2014b). However, there is no gold standard for the assessment of the construct, and it can be difficult to evaluate the scientific rigor of research designs (Zeman, Klimes-Dougan, Cassano, & Adrian, 2007). This makes the field of emotion regulation vulnerable for overinterpretations of findings and studies potentially failing to address their research questions properly (Cole, Martin, & Dennis, 2004).

Children's emotion regulation has been investigated by a variety of approaches (e.g., observational-behavioral, biological, interviews with children, or other-reports, see; Adrian, Zeman, and Veits (2011) for a 35- year review). The validity of such studies rests upon the validity of the measures involved. As I will describe in detail later, cross-cultural differences imply that the validity of findings in one culture do not necessarily translate into another context. Accordingly, specific analyses should be undertaken in the culture at hand (Zeman et al., 2007). A literature search did not reveal any validated measurement tools for the assessment of emotion regulation in Norwegian children (see *PsykTestBarn* (2019) for an inventory of tests and assessment tools used by Norwegian child psychologists). Hence, psychometric information related to an appropriate measure of children's emotion regulation would have high utility for developmental research conducted in Norway.

The Emotion Regulation Checklist (ERC; Shields & Cicchetti, 1997) is a brief other-report questionnaire for the assessment of emotion regulation in children 3-15 years old, used in numerous studies to investigate a diverse range of emotion regulation related phenomena. To illustrate, the instrument has been used to investigate the relationships between emotion regulation, resilience and hemispheric electroencephalogram asymmetry (Curtis & Cicchetti, 2007), and it has contributed to the understanding of the mediating effect of emotion regulation and emotion lability-negativity on internalizing symptomology in children over time (Kim-Spoon et al., 2013). Further, the ERC has highlighted the role of emotion

regulation and dysregulation in children with specific language impairments (Fujiki, Brinton, & Clarke, 2002) and in children's bullying and victimization (Shields & Cicchetti, 2001) — to mention a few of its applications.

These studies include ERC ratings performed by parents, teachers and camp counselors. Some have assessed the ERC at one timepoint, whereas other studies have had a longitudinal design, including investigations of trajectories of emotion regulation and negativity ((Blandon, Calkins, Keane, & O'Brien, 2008). Data from the ERC is seen in connection with self-report measures, other-reports from teachers, counselors and parents, social and economic factors, physiological and observational data, and peer review. This wide array of phenomena and different use of methodology makes the ERC appear like a versatile tool for examining emotion regulation in children.

In the original work on the ERC, emotion regulation was conceptualized as "The capacity to modulate one's emotional arousal such that an optimal level of engagement with one's environment is fostered (Shields & Cicchetti, 1997)". Principal component analyses (PCA) of summer camp participants suggested that the ERC measures two subdimensions of emotion regulation; emotion regulation (ER) and lability/negativity (L/N). The ER subscale is believed to reflect adaptive regulative processes including emotional understanding, empathy and socially appropriate emotional displays, and is measured by 8 items (e.g. "Is a cheerful child"; "Responds positively to neutral or friendly overtures by adults"). Higher score on this factor is believed to indicate adaptive emotion regulation skills. The L/N subscale is composed of 15 items reflecting mood swings, angry reactivity and dysregulated positive emotions (e.g. "Is prone to angry outburst/tantrums easily"; "Is whiny or clingy with adults"). Higher scores are believed to reflect dysregulation. Item 12 did not load on any of the factors in the initial validation analysis.

The assessment tool has demonstrated favorable reliability (Blandon et al., 2008; Curtis & Cicchetti, 2007), it has been translated to at least seven languages (eg., Chang, Schwartz, Dodge, & McBride-Chang, 2003; Kapçı, Uslu, Akgün, & Acer, 2009), and support for its factorial structure has been reported in several cultures (Meybodi et al., 2018; Molina et al., 2014; Nader-Grosbois & Mazzone, 2015; Reis et al., 2016). However, the validity of the ERC has not been evaluated in any Scandinavian countries yet, including Norway. Hence, the overarching aim of the current research was to investigate the factorial and discriminate validity of the Norwegian version of the ERC. To aid the understanding of the ERC and findings, I will first delineate to the need for cross-cultural validation, before turning to previous validation attempts in other cultures.

The Need for Cross-cultural Validation

There seems to be both variations and similarities among cultures in the appraisal, communication and the manner people deal with emotions (Cole, 2014; Cole, Bruschi, & Tamang, 2002; Cole & Tamang, 1998; Keenan & Evans, 2009; Saarni, 1999; Thompson, 1994). Albeit observed differences in cross-cultural studies are often interpreted as culturally based differences in perceptions and attitudes, these differences may be unrelated to the construct of interest (Cheung & Rensvold, 2000). Rather, the comparability of cross-cultural data can be challenged by one or more measurement anomalies, often referred to as bias (He & van de Vijver, 2012). This makes the demonstration of equivalence (lack of bias) a prerequisite for any cross-cultural comparison.

Three types of bias that affect measurement equivalence were identified by van de Vijver and Poortinga (1997): construct, method and item bias. Construct bias is conceptual and denotes that the theoretical construct itself has a different meaning across groups. Researchers often base their conceptual foundation on English words and terminology, without exploring whether the concept itself is applicable in different cultures. Whereas this form of bias concerns theoretical validity, method and item bias can be assessed quantitively. As implied by its label, method bias results from differences across populations with regards to the methods used. Examples are differences in sampling procedures, different administrations of questionnaires and variations in familiarity with stimuli (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014; Heeringa & O'muircheartaigh, 2010). Bias on the item level reflects poor translations and terms that have a culture-specific meaning, resulting in different meaning of the same item in different adaptions of an instrument.

As emotion as a linguistic category is non-universal, the translation of emotion words across cultures can be challenging (Adrian et al., 2011). English terms for emotions such as *anger, fear* or *love* often cannot be directly translated into other languages with the intended meaning intact (Russell, 1991). Additionally, familiar emotion-words may carry different associations in different societies. This was demonstrated in a word association task with the stimulus word *"depression"* and the corresponding Japanese term "*yuutsu"* (Tanaka-Matsumi & Marsella, 1976). Japanese-Nationals associated more external referent terms (e.g. "rain" and "cloud") and somatic referent terms (e.g. headache" and "fatigue") to the word "*yuutsu"*. This differed from Japanese-Americans and Caucasian-Americans who predominantly associated internal mood state terms (e.g. "sad" and "lonely") to the word *"depression".* As so, this illustrates why it is clearly inadequate to use an assessment measure merely based on its translation into the language of choice (Schmitt & Kuljanin, 2008). To assure the quality of

the translation, back-translation by bilinguals is frequently used. However, back-translations can only contribute to achieving the best translation possible, without saying anything about its exact equivalence. Hence, it is an insufficient validity marker (Russell, 1991).

Response style bias. Even items that are successfully translated and similarly understood across populations can yield biased results if the scale measuring the item is used differently (Davidov et al., 2014). The tendency to use certain categories of the answering scale due to some factors other than the target construct is referred to as response style. Such response-style differences between populations can be explained in terms of social desirability, different tone of an item in different languages, a belief that a high score is a better score, or a preoccupation with individual defect and deficiencies (Lentz, 1938). Notably, likert-scale response categories seems particularly susceptible to differences in utilization of the different points on response scales (Smith, 2004). One of the most prevalent response styles is acquiescence (acquiescence response style; ARS), the tendency to agree (or disagree) to propositions in general. Cultural differences in ARS are associated with intercept non-invariance as well as factor form non-invariance in more extreme cases, and can be tested for in terms of equality of intercepts (Cheung & Rensvold, 2000). These analytical concepts are more thoroughly described later.

Although many researchers primarily consider ARS a rather superficial source of statistically nuisance in need of correction, others treat the response style as a manifestation of substantive personal and/or cultural differences (Couch & Keniston, 1960). The latter viewpoint has provided evidence of a relationship between ARS and both individual and country level differences (He, Bartram, Inceoglu, & van de Vijver, 2014; Rammstedt, Danner, & Bosnjak, 2017; Rammstedt, Kemper, & Borg, 2013; Smith, 2004). Specifically, a study applying multilevel analysis to a representative sample of almost 40 000 respondents from 20 European countries identified educational attainment and conservatism as determinants of acquiescence at an individual level. Moreover, country-levels of corruption and collectivism explained 15% of the variation in acquiescence. Higher country-levels of corruption and collectivism were associated with higher levels of acquiescence (Rammstedt et al., 2017). In accordance to this, the Norwegian sample data showed a relative low level of acquiescence (M=3.16, SD = 0.31) compared to other European countries (M= 3.34, SD = 0.34).

Assessment of Cross-cultural Measurement Invariance

One of the best methods to examine if the same latent construct has been measured equivalently across heterogenous groups is to test for *measurement invariance* (Chen, 2007). Tests of measurement invariance can be applied at different levels to investigate whether an instrument has the same psychometric properties across groups. The minimal level of measurement invariance is *configural invariance* (also called factor form invariance). It tests whether the same item is associated with the same factor in each group, and indicates that similar, but not identical, latent constructs has been measured in the groups. However, the factor loadings may still differ at this level of assessment. *Metric invariance* or equality of factor loadings is required to examine if scale items are interpreted similarly (Byrne, 2013; Chen, 2007). Even stricter invariance requirements include *scalar invariance* and *strict factorial invariance*. This involves equality of intercepts and latent error terms across different groups, and are seldom supported (Chen, 2007). As this study relies solely on Norwegian sample data, invariance of factor loadings, latent intercepts and error terms cannot be evaluated. Thus, only the basic form of measurement invariance, namely factor form invariance, will be tested.

Although some ERC-items are reversely scored, the weight of positive and negative valenced items in each subscale is inequal. As such, because the L/N scale is dominated by negative descriptions of the child and the ER scale is dominated by positive descriptions of the child, scores on the ERC could be particularly vulnerable to respondent's level of acquiescence. Since ARS represent a serious concern for the validity of cross-cultural research, and no adaptions of the ERC has been examined for ARS yet, I will include an indicator of this type of bias in the validation of the Norwegian version of the ERC. However, no dedicated ARS measure was included in the sampling of the data. Fortunately, ARS is found to be consistent across domains (Danner, Aichholzer, & Rammstedt, 2015). This means that persons who tend to ARS in one type of items (e. g. emotion items) are likely to equally attend to ARS in other types of items (e. g. personality items). In search of ARS then, an alternative approach to identifying ARS bias will be introduced in the method-section, in addition to checking for factor form invariance. To provide a basis for evaluating the results of ERC validity indicators, the next section gives an overview of the previous use and validation of the ERC.

Cross-cultural Validation of the ERC

The ERC has been translated and validated for use in different languages and cultures, including Italian (Italian sample; Molina et al., 2014), Portuguese (Brazilian sample; Reis et al., 2016), Persian (Iranian sample; Meybodi et al., 2018) and French (Belgium sample; Nader-Grosbois & Mazzone, 2015). A summary of the respective findings is provided below in order to provide context for the validation of the Norwegian version of the ERC. For convenience reasons, the different studies are referred to according to the language in which the respective versions of the ERC were adopted to. This should not be taken as an account for the respective sample's representativeness for entire countries or cultures.

Factorial validity. All four previous studies undertook an exploratory approach. The exploratory factor analysis (EFA) of the parent-rated Italian version of the ERC showed problematically low loadings of several items. Although the EFA of the teacher-rated Italian version showed higher resemblance to the original two-factor structure, two items showed loadings lower than .25. If a stricter criterion of factor loading level had been used (e.g. .35 or .40), low factor loadings would also have been an issue in the Persian and Portuguese studies. Cross-loading items were evident in all four studies, and the correlation between the two scales varied between r = -.30 in the Italian study to r = -.66 in the French. Albeit there were several differences between the two-factor solutions proposed by the EFAs and the original solution, all studies reported support for a two-factor solution resembling the original solution by Shields and Cicchetti (1997). In addition, a confirmatory factor analysis (CFA) of the Italian sample data yielded modest support for the original two-factor model, although the standardized level of mean square residual (SRMR = .10 for both parent and teacher rated ERC) was a bit high (Byrne, 2013; Molina et al., 2014), indicating sub-optimal fit. Note that the studies of the Portuguese and the French versions of the ERC failed to mention which criteria the extraction of factors were based upon, and that significance levels of the factor loadings were not reported for the French and Turkish studies.

Discriminant and convergent validity. Overall, the studies were able to demonstrate the convergent and divergent validity of the ERC when it comes to a range of different constructs, including emotional, behavioral and health problems, as well as social skills and social competence. Nonetheless, the results were differing between the parent and the teacher rated scores in the Portuguese sample. There could be several reasons for this, including time spent with the child and social desirability.

Generalizability. The choice of sampling and analytic strategy varied between the studies. Whereas the examinations of the Persian and Portuguese versions of the ERC used

convenient, non-randomized sampling methods, the sampling method of the French and Italian studies were not reported. The Italian, Portuguese and French studies included both parent and teacher reported ERC (P-ERC and T-ERC), whereas the Persian study only examined parent-reports. Furthermore, the French/Belgium sample was somewhat small (n=152). In addition, the examination of the Portuguese version of the ERC was the only one to consider the ordinal level of likert-scale data, despite the many pitfalls of treating ordinal data as continues (Brown, 2015). Unfortunately, the use of convenience sampling, only one type of rater, small research samples and disregarding the ordinal level of the data are all factors that limit the generalizability and interpretation of the findings.

Taken together, exploratory analyses of ERC data from four diverse cultures have provided two-factor structures that resemble to the original model of the ERC (Shields & Cicchetti, 1997). Support was found for the usage of all mentioned adaptions of the ERC, except for the parent version of the Italian version. That said, an exploratory approach can only indicate--but not test--correspondence to the original ERC solution. However, a more appropriate approach to this endeavor, a confirmatory analysis revealed modest fit of the original two-factor model in the Italian sample. Further, all four studies showed several areas of mis-fit, and the authors of the French, Italian and Portuguese study called for further examinations of the instrument to support its use.

So far, factorial validation attempts have been conducted in cultures with arguably different parenting attributions and attitudes (Lansford & Bornstein, 2011), underscoring the need for specific studies of the ERC in the more lenient and permissive Scandinavian cultures. The present study is based on examination of parent and teacher ratings of the ERC in a large Norwegian sample across childhood (age 6, 8, 10 and 12). Specifically, I aimed to test for; (a) factor form invariance by examining the fit of the original theoretical model proposed by Shields and Cicchetti (1997) in a representative Norwegian community sample using CFA of parent and teacher rated data, followed by a specification search to explore if parameter alterations would improve the fit to the data; (b) alternative conceptually meaningful factor structures using EFA; (c) the stability of the established structure over six years of time with regards to invariance of factor loadings, intercepts and residuals; (d) the extent to which the ERC scales are contaminated by acquiescence response style (ARS).

Method

Sample and Procedure

The present work uses data from the second to fifth waves of the Trondheim Early Secure Study (TESS; Steinsbekk & Wichstrøm, 2018). The aim of the TESS is to identify risk and protective factors in mental health and psychosocial development in children and adolescents. A letter of invitation to participate in the study was sent to the parents of the 2003 and 2004 birth cohorts (*N*=3456) living in the city of Trondheim, Norway (approx. 182,000 inhabitants) prior to a community health check-up for their 4 years old children. The check-up is a free service for all Norwegian children. In all, 3358 (97%) children met at the clinic and was informed about the study by a health nurse. In order to increase variability and thus statistical power, children with mental health problems were oversampled based on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) completed by parents. The children were divided into four strata according to their total-difficulties SDQ scores (cut-offs 0-4, 5-8, 9-11 and 12-40) with increased drawing probability with increasing SDQ-scores (.37, .48, .70 and .89, respectively). Parents with lacking proficiency in Norwegian to complete the examination (n= 176) were excluded. The health nurses missed asking parents of 166 children. Of the eligible parents (*n*=3,016), 2,475 gave informed consent, and 1,250 children were drawn to participate by a random number generator according to the stratification procedure described above. Parent and/or teacher response on the Norwegian version of the ERC were collected from a total of 876 children (50.5 % girls) when the children were six, eight, ten and twelve years old. Parents respondents were primarily mothers (84,4%). Attrition rates were low and could not be explained by factors such as gender, attachment, social skills, emotion regulation, behavioural functioning, effortful control, parental mental health and socioeconomic status (Skalická, Belsky, Stenseng, & Wichstrøm, 2015; Viddal, Berg-Nielsen, Belsky, & Wichstrøm, 2017; Viddal et al., 2015). The parents of the sample was compared to parents of 4-year olds in Norway, and proved comparable to the Norwegian parent-population in terms of level of education and family situation (Steinsbekk & Wichstrøm, 2018). In addition, parent response on the Children's Behaviour Questionnaire-Short form (CBQ-S; Putnam & Rothbart, 2006) were collected at age six (*n*= 753). See the TESS' Cohort Profile (Steinsbekk & Wichstrøm, 2018) for further details concerning the recruitment process and baseline sample characteristics.

Measures

Emotion Regulation Checklist (ERC). The ERC (Shields & Cicchetti, 1997) is an other-rapport questionnaire and consists of 24 items that are rated on a 4-point scale ranging from 1 (*almost always*) to 4 (*never*). The original two-factor solution is by far the most widespread operationalisation of the latent constructs of the ERC (including the earlier mentioned validation studies). Nevertheless, to achieve a single emotion regulation criterion, a composite score has been generated by reverse scoring all negatively weighted items and then averaging across all 24 items (Fujiki et al., 2002; Ramsden & Hubbard, 2002; Shields & Cicchetti, 1997). Factor analysis has also pointed to a three-factor solution (Curtis & Cicchetti, 2007). The original study reported internal consistency reliability for the Lability/Negativity scale ($\alpha = .96$), the Emotion Regulation scale ($\alpha = .83$) and the single emotion regulation measure ($\alpha = .89$; Shields & Cicchetti, 1997). The two subscales were negatively correlated ($r = -.50$, $p < .001$).

The ERC was translated from English to Norwegian in 2013 by two bilingual clinical psychologists, one of them professor at the Norwegian University of Science and Technology (NTNU) and both specialists within the field of developmental psychology. To ensure the quality of the translation, it was back-translated to English by a third bilingual clinical psychologist and professor at NTNU. Finally, the back-translation was authorized by Dante Chicchetti, one of the original authors of the instrument.

The Children's Behavior Questionnaire- Short form (CBQ-S). The CBQ-S (Putnam & Rothbart, 2006) is a caregiver report measure developed to assess the temperament of young children. As the original form of the CBQ (Rothbart, Ahadi, Hershey, & Fisher, 2001), the short form of the measurement gives a highly differentiated assessment of temperament based on 15 scales, e.g. activity level, discomfort and shyness. Respondents are instructed to rate the child's behavior as it occurs now or within the previous two months using a 3-point scale (*not true, somewhat or sometimes true, very true or often true*).

Constructing of an Acquiescence Response Style Scale. The TESS does not include a measure purposely included to measure acquiescence with content wise fully balanced items. However, the CBQ consists of both purportedly positively (e.g. "If upset, cheers up quickly when s/he thinks about something else") and negatively (e.g. "Hardly ever laughs out loud during play with other children," valenced descriptions of the child for each of the 15 scales. The arguably preferred way of measuring acquiescence is through balanced scales containing pairs of items with similar content but opposite valence (e.g. "I am an outgoing person" versus "I am a reserved person"). Hence, when summing positively and negatively

worded items with the same content, a higher score will indicate positive acquiescence (yea-saying), whereas a lower score will indicate counter-acquiescence (nay-saying).

Of note, the valence of items describing temperament are not necessarily easily categorized on a positive-negative continuum, and the categorization may also differ between respondents; what one person might consider a negative description of a child (e.g. "Is highly energic") is not necessarily so for another person. Whereas some apprehend high energy levels as a sign of indiscipline and maladjustment, others may understand the same behavior as a healthy expression of joy and vitality. To increase the likelihood that the negatively worded items did in fact tap into negative descriptions and the positively worded items did measure positive behavior, six specialists within the field of developmental psychology were asked to independently judge if the individual statements were; 1) "unambiguously positively formulated (refers to positive characteristics or behavior from the child)", 2) "negatively formulated (refers to negative characteristics or behavior from the child", or 3) "the statement is neutral or not unambiguously positive or negative, or non-categorizable".

The interrater reliabilities between multiple pairs of raters (Janson & Olsson, 2004) were: positive k=.55; negative k=.55; neutral/not possible to categorize k=.32. Hence, overall agreement about the valence of ERC items was only modest to moderate. Therefore, a selected pool of items was drawn. For an item to be included in the further analysis, five out of six specialists had to agree on its positive or negative valence. To avoid a resulting measure to be confounded with temperament characteristics, items deemed positive were matched with items deemed negative from the same subscale. By these criteria, we identified eight item-pairs from five different CBQ subscales. Then, a positive (POS) and a negative (NEG) scale were constructed by averaging the scores of the positive and the negative items from the CBQ-item pairs, respectively. The sum of POS and NEG then forms the Acquiescence scale, with a high score indicating yea-saying and a low score indicating nay-saying**.**

Data Analysis Plan

Analyses were performed in Mplus Version 8 (L. K. Muthén & Muthén, 2017).

CFA: factor form invariance. To validate the ERC for use in the Norwegian context, conceptual equivalence was operationalized as factor form invariance (Chen, 2007; Cheung & Rensvold, 2000). The fit of the established two-factor solution (Shields & Cicchetti, 1997) was examined by CFA within the framework of structural equation modelling (SEM; Byrne, 2013) to check if the same survey items were associated with the same underlying factors. The use of a confirmatory approach was justified by previous cross-cultural evidence of a

two-factor solution (see introduction), although the theoretical foundation for the subscales seems somewhat unclear. In addition, the CFA framework provides analytical possibilities non-available in EFA. Relevant for this study, this includes verification of the number of the latent structures of a measuring instrument and the examination of the stability or invariance of the factor model over time and respondents (Brown, 2015). Further, using a confirmatory approach enables testing of the viability of the single total scores (composite of all items). As the ERC has previously been used to compute such a score (Ramsden & Hubbard, 2002; Shields & Cicchetti, 1997), we tested the validity of this general ER factor by investigating if all the items were meaningfully related to one factor (Brown, 2015). CFA analysis were performed for both the P-ERC and the T-ERC at all time points.

Data were treated on an ordinal level to avoid the potential consequences of treating ordered categorical variables as continues variables, such as incorrect estimates of test statistics, standard errors and indicator relationships (correlations; Brown, 2015). Since children with mental health problems were oversampled, analyses were weighted to generate unbiased general population estimates. Thus, population weight was applied corresponding to the number of children in the population in a particular stratum divided by the number of participants in that stratum (i.e., low scorers on SDQ were "weighted up" and high scorers were "weighted down"). The robust weighted least square (WLS) estimator WLSMV was chosen as estimator as it has shown to perform well in CFA modelling of ordinal data under various conditions (different sample size, varying degrees of non-normality and model complexity; Brown, 2015; Liang & Yang, 2014). The WLSMW builds on the method described by B. Muthén (1984), and use polychoric correlations and thresholds with ordered categorical data. As with WLS, WLSMV tends to overestimate chi-square test statistics and underestimate standard errors. However, biases are typically small and considerably smaller than with WLS (Brown, 2015; Hu & Bentler, 1999). Several other fit indices and criteria were used to determinate the goodness-of-fit, including comparative fit index (CFI; Bentler, 1990) greater than .95, Tucker-Lewis index greater than .95 and root-mean-square error of approximation (RMSEA) less than .06 (Hu & Bentler, 1999). With respect to sample size and the pursuit of both statistically and substantive meaning, factor loadings greater than 0.40 were interpreted as salient (Stevens, 2009). Significance levels for loadings were set to .05. All available data were used without imputing values or deleting cases. WLSMV enables this through a multi-step process based on the assumption that, conditional on covariates, missing data are non-informative and missing completely at random (L. K. Muthén & Muthén, 2017).

CFA: post hoc analyses. To explore if incorporation of additional parameters would provide a better fit to our sample data, the results from the CFA at age 6 was followed up by a specification search (Maccallum & House, 1986), in line with Byrne (2013, p. 88). The procedure enables researchers to go into an explorative mode to identify mis specified parameter constraints whilst still using CFA procedures. This was done by assessing all fixed parameters and establish which parameters, if freely estimated, would contribute to a significant drop in the chi-square statistics, based on the Mplus Modification Index (MI). However, as chi-square difference in WLSMV is not distributed as chi-square, the conventional approach of difference testing (using the difference between the chi-square values and the difference in the degrees of freedom to compare model fit) was not appropriate (L. K. Muthén & Muthén, 2017, p. 507). The relative fit of the restricted models were evaluated with regards to scientific parsimony and the substantive meaning of the new parameters, in addition to goodness-of-fit statistics (Brown, 2015; Byrne, 2013).

CFA: stability over time. Originally, I intended to test the stability of the model(s) over six years of time. However, as the later results will reveal, adequate fit of the model(s) was not supported by the CFA, thus further attempts to compare latent means were abandoned, and therefore details of the analysis plan is not described here.

EFA: exploring alternative latent structures. Considering evidence of differing factor solutions presented by previous cross-cultural validations of the ERC, the initial CFA was supplemented by an EFA of all ERC items to examine if other solutions provided better fit to the Norwegian sample data. Since the factors were expected to be correlated, geomin oblique rotation was applied (Brown, 2015), using the same computer program, estimator, weight, fit and loading criteria as in the CFA. Because selection of too many (overfactoring) or too few factors (underfactoring) can severely compromise the validity of the factor model and its resulting estimates (Brown, 2015), possible factor solutions were systemically examined. As there should be at least three variables per factor, solutions with one to eight factors were examined (Fabrigar, Wegener, MacCallum, & Strahan, 1999). The solutions were evaluated based on the screeplot of eigenvalues from the unreduced correlation matrix (Cattell, 1988), the Kaiser criterion of eigenvalues from the input correlation matrix (Kaiser, 1960), the goodness-of-fit statistics, as well as scientific parsimony, theoretical meaningfulness and interpretability.

Response bias: acquiescence. Correlations between the P-ERC and the Acquiescence scale were examined in order to evaluate if parent rated ERC is contaminated by acquiescence.

Results

Descriptive statistics are reported in Table 1. To simplify comparison across samples, data were treated on an interval level for the purpose of descriptive analysis., Data were treated on an ordinal level for the rest of the analysis.

Table 1.
Descriptive Statistics for the P-ERC and the T-ERC at age 6-12 years

Age	Scale	M (SD)	Range
		P-ERC	
6 years (*n*=753)	ER	3.42 (.34)	2.00 – 4.00
	LN	1.65 (.30)	1.00 - 2.87
8 years (*n*=659)	ER	3.48 (.34)	1.88 -4.00
	LN	1.60 (.31)	1.00 -2.73
10 years (*n*=691)	ER	3.48 (.37)	1.88 – 4.00
	LN	1.57 (.31)	1.00 - 2.73
12 years (*n*=653)	ER	3.43 (.38)	2.00 – 4.00
	LN	1.49 (.30)	1.00 – 2.67
		T-ERC	
6 years (*n*=787)	ER	3.33 (.44)	1.25 - 4.00
	LN	1.45 (.32)	1.00 – 2.73
8 years (*n*=605)	ER	3.40 (.43)	1.50 – 4.00
	LN	1.38 (.32)	1.00 – 3.07
10 years (*n*=658)	ER	3.31 (.46)	1.88 – 4.00
	LN	1.41 (.34)	1.00 - 3.20
12 years (*n*=627)	ER	3.26 (.48)	1.38 – 4.00
	LN	1.50 (.43)	1.00 – 3.67

Note. P-ERC = parent version of the emotion regulation checklist; T-ERC = teacher version of the emotion regulation checklist; ER = Emotion Regulation; LN= Lability/Negativity

Confirmatory Factor Analysis

CFA: factor form invariance. Confirmatory analysis of Shields and Cicchetti's two-factor model showed adequate standardized factor loadings (≥ .40) for most items across all timepoints for both parent and teacher raters, but note that the CIs exceed .40 (see Table 2 for age 6, and Appendix A for age 8, 10 and 12). Item number 20 stands out, as it showed consistently low loadings for all assessments of the ERC. In addition, item number 11, 17 and 23 evinced modestly low loadings for parent raters at some timepoints. The two factors were highly correlated (r= -.72, -.65, -.66 and -.67 for P-ERC and r= -.66, -.70, -.64 and -.63 for T-ERC). However, the model revealed poor fit for data obtained by both parents and teachers at all timepoints, as indicated by the goodness-of-fit statistics (see Table 3 for age 6, and Appendix B for age 8, 10 and 12). Moreover, the one-factor solution representing a composite ER score also displayed inadequate fit across all assessment of the ERC (as reported in the

same tables). Except for the reference indicator of each latent factor, all factor loadings, thresholds, factor variances and factor covariances were freely estimated in the CFA analysis.

Table 2.

Factor Loadings from the Unconstrained Confirmatory Factor Analysis of Shields and Cicchetti's Two-Factor Model of the P-ERC and T-ERC at age 6

	Item	Description	P-ERC (*n*= 753)	T-ERC (*n*= 787)
L/N	2	Mood swings	.69 [.63, .75]	.78 [.73, .84]
	4	Transitions well	-.60 [-.66, -.55]	-.54 [-.61, -.46]
	5	Recover Quickly	-.69 [-.74, -.64]	-.66 [-.72, -.60]
	6	Easily frustrated	.54 [.47, .60]	.65 [.60, .70]
	8	Outbursts of anger	.64 [.58, .71]	.73 [.66, .79]
	9	Able to delay gratification	-.56 [-.62, -.50]	-.53 [-.59, -.46]
	10	Pleased to see others distressed	.55 [.45, .65]	.63 [.52, .74]
	11	Excitement modulation	-.40 [-.47, -.33]	-.48 [-.56, -.41]
	13	Disruptive outbursts of energy	.67 [.60, .74]	.67 [.59, .76]
	14	Anger at limit-setting	.53 [.46, .60]	.75 [.66, .83]
	17	Overly exuberant	.44 [.35, .53]	.54 [.45, .64]
	19	Negativity towards peer-approach	.50 [.40, .61]	.64 [.53, .74]
	20	Impulsivity	**.21 [.12, .30]**	**.29 [.21, .37]**
	22	Intrusive exuberance	.53 [.44, .61]	.69 [.63, .76]
	24	Negative emotions when engaging to play	.43 [.32, .54]	.69 [.59, .70]
ER	1	Cheerful	.63 [.56, .70]	.66 [.61, .72]
	3	Positive response to adult approaches	.65 [.60, .70]	.71 [.66, .77]
	7	Positive to peer overtures	.81 [.75, .86]	.77 [.71, .82]
	15	Manage talk about negative states	.56 [.49, .63]	.61 [.54, .67]
	16	Seems sad	-.51 [-.61, -.41]	-.76 [-.82, -.70]
	18	Flat affect	-.58 [-.73, -.43]	-.70 [-.76, -.63]
	21	Empathy	.59 [.52, .66]	.77 [.72, .82]
	23	Appropriate negative emotions	**.34 [.26, .42]**	.55 [.48, .62]

Note. P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist; ER = Emotion Regulation; LN= Lability/Negativity; All loadings are significant, $p < .000$; loadings <.40 are printed in bold type.

CFA: post hoc analysis. The specification search at age 6 suggested multiple, albeit different, areas of ill-fit of the P-ERC and the T-ERC (see Table 3). The inclusion of several cross-loading items considerably improved the fit of the solutions. However, the number as well as the content of elements needed to be included in the model to achieve acceptable fit statistics were difficult to justify on a theoretical basis, as was different model constrains for

teacher and parent reports. Accordingly, the specification search did not reveal additional parameters that resolved the fit issues of the Norwegian version of the ERC.

Table 3.
Model summary of Confirmatory Factor Analysis of the P-ERC and T-ERC at age 6, including Specification Search

Model	*df*	X^2	CFI	TLI	RMSEA [90% CI]
			P-ERC		
			6 years		
M1, Shield & Cicchetti's original model	229	1244.0	.813	.793	.077 [.073, .081]
M2, composite ERC score	252	1471.3	.783	.763	.080 [.076, .084]
M3, M1 item 5 crossloading	228	1166.0	.827	.808	.074 [.070, .078]
M4, M1 items 5, 4 crossloading	227	1060.7	.846	.828	.070 [.066, .074]
M5, M1 items 5, 4, 9 crossloading	226	945.1	.867	.851	.065 [.061, .069]
M6, M1 items 5, 4, 9, 11 crossloading	225	817.5	.891	.877	.059 [.055, .064]
M7, M1 items 5, 4, 9, 11, 16 crossloading	224	735.9	.905	.893	.055 [.051, .060]
			T-ERC		
			6 years		
M1, Shield & Cicchetti's original model	229	1271.8	.845	.828	.076 [.072, .080]
M2, composite ERC score	252	1723.8	.783	.762	.086 [.082, .090]
M8, M1 item 20 crossloading	228	1145.5	.863	.848	.027 [.067, .076]
M9, M1 items 20, 5 crossloading	227	996.7	.885	.872	.066 [.061, 0.70]
M10, M1 items 20, 5 and 22 crossloading	226	921.6	.896	.884	.063 [.058, .067]
M11, M1 items 20, 5, 22 and 17 crossloading	225	850.9	.907	.895	.059 [.055, .064]
M12, M1 items 20, 5, 22, 17 and 13 crossloading	224	771.6	.918	.908	.056 [.051, .060]

Note. P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist; ERC = Emotion Regulation Checklist; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean square error of approximation

CFA: stability over time. Because the confirmatory analyses provided evidence of inadequate fit of both the original two-factor model and the general ER-factor, and further that no adjustment resulting in better fit could be justified, no attempts were made to check the stability of the construct over time.

Exploratory Factor Analysis

EFA: Teacher ERC. The correlation matrices of the EFAs revealed that the first five (age 6 and 12) or six (age 8 and 10) factors had eigenvalues above one (as reported in Appendix C). Thus, Kaiser's criterion implied a five or six- factor solution. As opposed to this, the scree plots of eigenvalues suggested two- or three-factor solutions (see Appendix D).

RMSEA-levels were satisfactory for all solutions at all ages, except the unidimensional one. With regards to CFI- and TLI-criteria, the three- to eight-factor solutions were considered adequate at age 6, 8 and 10 (the TLI value of .948 of the three-factor solution at age were considered just acceptable), whereas only the four- to eight factor solutions met the criteria at age 12. Model summaries at age 6 are reported in Table 4, see Appendix E for age 8, 10 and 12.

Table 4.

Model summary of Exploratory Factor Analysis of the P-ERC and T-ERC at age 6

		P-ERC				T_ERC			
	df	x^2	CFI	TLI	RMSEA [90% CI]	x^2	CFI	TLI	RMSEA [90% CI]
					6 years (n = 787)				
2	229	743.5	.909	.890	.055 [.050, .059]	783.1	.918	.901	.055 [.051, .060]
3	207	427.9	.961	.948	.038 [.033, .043]	427.9	.967	.957	.037 [.032, .042]
4	186	343.6	.972	.958	.034 [.028, .039]	330.8	.979	.968	.031 [.026, .037]
5	166	259.0	.983	.973	.027 [.021, .034]	246.2	.988	.980	.025 [.018, .031]
6	147	214.7	.988	.977	.025 [.017, .032]	205.6	.991	.984	.023 [.015, .029]

Note. The rows indicate the number of factors extracted. P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean square error of approximation

Table 5.

EFA of the P-ERC and T-ERC at age 6: Alternatives to Shields and Cicchetti's model

	2 factors				3 factors					4 factors					
	1	2	CL	LL	1	2	3	CL	LL	1	2	3	4	CL	LL
P-ERC	ERP (6/6) LNR (4/4)	LNP (11/11) ERR (2/2) 12			ERP (6/6) LNR (4/4)	LNP (11/11) ERR (2/2) 12	ERP (-1, 23) LNP (2, 6, 8) LNR (11)	1, 11, 23 on F1/F3; 6, 8 on F2/F3		ERP (6/6) LNR (4/4)	LNP (11/11) ERR (2/2) 12	ERP (-1, 23) LNP (2, 6, 8)	ERP (-21) LNP (10, 19)	1, 23 on F1/F3; 2, 6 on F2/F3; 10, 19 on F2/F4	
T-ERC	ERP (6/6) ERR (-16, -18) LNR (5)	LNP (11/11)		5, 9, 11, 12	ERP (6/6) LNR (4/4) ERR (-2/2)	LNP (11/11) 12	LNP (2, 6) ERR (2/2) 12	16, 18 on F1/F3 2, 6, 12 on F2/F3		LNP (2, 6, 14) ERR (16) 12	ERP (6/6) LNR (4/4)	LNP (11/11)	ERR (2/2) LNP (19)	2, 6 on F1/F3, 16 on F1/F4, 19 on F3/F4	23

Note. The columns indicate the numbers of factors extracted; the rows indicate timepoint of data collection; negative loading on a factor is indicated by (-); P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist; CL = Cross-Loadings; LL = low loading items; ERP = positively scored items from the ER-subscale; ERR = reverse scored items from the ER-Subscale; LNP = positively scored items from the L/N subscale; LNR = reversed scored items from the L/N subscale; F = factor

Previous research has concluded on two- or three-factor solutions. Accordingly, the two- to six factor solutions of the P-ERC were examined, even though the CFI- and TLI-values suggested that the two-factor solutions showed inadequate fit in the sample data. However, all five- and three six-factor solutions yielded one or more factors with substantial loading (i.e. ≥.40) of only two or less items. Consequently, these solutions were considered undetermined, and thus probably poor models of the ERC. Thus, the focus of the following will be the two- to four-factor solutions of the P-ERC.

There were no strong alternatives to Shields and Cichetti's model (see Appendix F for goemin rotated loadings, Table 5 for alternative solutions at age 6, and Appendix G alternative solutions for age 8, 10 and 12). With small variations, the first factor of the two-factor solutions was comprised of positively scored ER-items and reversed scored L/N items, while the second factor included positively scored L/N-items, reversed scored ER-items and item 12. Consequently, the first factor was regarded a positively valenced factor, while the second factor was regarded a negatively valenced factor. Please recall that item number 12 did not load on any of the subscales in the original model of the ERC, although it seemed to load on the same factors as positively scored LN-items in this analysis. To be noted, all the three- and four-factor solutions of the P-ERC replicated the positively and negatively valenced factors to some extent, even though the solutions for the various timepoints were quite dissimilar.

EFA: Teacher ERC. The first five (age 6 and 8) and four (age 10 and 12) factors of the correlation matrix of the T-ERC had eigenvalues greater than 1, whereas the scree-plots suggested two-factor solutions (see Appendix C for eigenvalues and Appendix D for scree-plots). At age 6, all solutions except the unidimensional one showed adequate RMSEA values (model summaries at age 6 are reported in Table 4). But unlike the P-ERC, the RMSEA statistic indicated inadequate fit for both the one- and the two-factor solutions at age 8, 10 and 12 (see Appendix E). The RMSEA values for the three- to eight factor solutions was considered sufficient, as were the CFI and TLI values for all ages (the .949 TLI value of the three-factor solution at age 8 was considered acceptable). With regards to previous research, model fit statistics, Kaisers criterion and scree-plots, the two- to five-factor solutions were examined. As with the P-ERC, several solutions were considered undetermined, including one four-factor solution, two five-factor solutions and three six-factor solutions. Hence, only the two- to four-factor solutions will be described in further details.

As opposed to that of the P-ERC, the two-factor solutions of the T-ERC mostly resembled Shields and Cicchetti's two-factor model, with the exception of some cross- or

low-loading items (geomin rotated factor loadings are reported in Appendix F. See Table 5 for alternative models at age 6, and Appendix G for age 8, 10 and 12). However, the three- and four-factor solutions seemed to be structured around the valence of the items, in line with that of the P-ERC. Whereas the addition of a third or fourth factor increased the fit of the solutions for both teacher and parent raters, it did not contribute to the meaningfulness or the clarity of the models. Because the L/N and ER scales consisted of mainly negatively and positively worded items, the poor solution may be due to differential responses to positive and negative items. A latent negative wording factor loading on all negatively worded items was therefore added to the model, but this model did not converge and could therefore not be tested. In addition, to explore the possibilities for a short version of the ERC, EFA were applied to the eight ER-items. The resulting models did not reveal acceptable fit, according to the aforementioned criteria.

Discriminant Validity: Acquiescence

When creating balanced acquiescence scales, one cannot guarantee that all items balance each other out. For example, one item may be seen as stronger, and thus more difficult to endorse fully than the seemingly opposite, e.g. "A withdrawn child" may be perceived as a stronger statement than "A lively child", at least by some. Hence, our acquiescence measure could potentially be contaminated by true negative descriptions of the child, or the reverse. If this was the case, one should expect teacher-ratings of the ERC to correlate with parents' acquiescence. If not, this would indicate discriminative validity of the acquiescence measure. Teacher-rated L/N and ER were indeed uncorrelated with acquiescence (r=.01, p=.88 and r=-.02, p=.71, respectively). Parent-rated L/N and ER, however, entered in the same model and being allowed to correlated with each other, did correlate with acquiescence (r=.26, p<.001 and r=-.16, p<.001, respectively), indicating that high scores on L/N reflects yea-saying (i.e. parents endorsing the predominantly negative statements in the scale) whereas low scores on ER is partly due to nay-saying (i.e. parents disagreeing with the predominantly positive statements in the scale).

Discussion

The aim of this study was to examine the factorial validity of the Norwegian version of the ERC as well as one aspect of discriminative validity; absence of acquiescence bias. The commonly used two-factor solution of the ERC consisting of a negativity-lability scale and an emotion regulation scale, was not supported. Additional post-hoc analyses in CFA and EFAs

did not result in any solution with adequate fit and interpretability. Moreover, the L/N scale was contaminated by yay-saying whereas the ER scale was to some extent influenced by nay-saying.

Factorial Validity

CFA. Confirmatory analysis showed inadequate fit of Shields and Cicchetti's model in the Norwegian sample. Several low loading items were identified, and the fit statistics was unsatisfactory for both parent and teacher raters at all timepoints. This differs from the findings of Molina et al. (2014) in the validation of the Italian version of the ERC, who reported modest support of Cicchetti and Shields's model by confirmatory analysis.

The specification search at age 6 did not reveal any sound model-alterations. However, the differences in MI between the P-ERC and the T-ERC might reflect differences in response style between teacher and parent respondents. Further, the high MI-values could point to the source of the fit-issues. Recall that the ER-subscale is believed to reflect adaptive regulation skills, while the L/N subscale is believed to capture dysregulation. Both subscales include positive and reversed scored items. As of the P-ERC, the high MI-values of the four reversed scored LN-items (items 4, 5, 9 and 11) on the ER-subscale may reflect the positive valence, rather than the content, of both the ER-scale and these items. Nevertheless, one could argue that there are regulational components in L/N-items such as item 5: "Can recover quickly from episodes of upset or distress (for example, does not pout or remain sullen, anxious or sad after emotionally distressing events)", thus supporting the crossloading of these items.

With regards to the T-ERC, L/N-items 13 ("Is prone to disruptive outburst of energy and exuberance"), 17 ("Is overly exuberant when attempting to engage others in play") and 22 ("Displays exuberance that others find intrusive or disruptive") showed high MI-values, representing cross-loadings on the ER-factor. This suggests that the specification of the cross-loading of these items would lead to a better fitting model, and may indicate that teachers perceive difficulties regarding "excessive exuberance" a concern more related to ER than L/N. Still, it can also imply difficulties with finding a suitable term for the translation of "exuberance" in Norwegian. As such, these items may communicate differently in the Norwegian version of the ERC, and therefore cause item bias as a result.

EFA. The exploratory analysis was inconclusive with regards to the number of factors; Kaisers criterion implied four to six factors, whereas scree-plots suggested two- or three-factor solutions. It is well known that the Kaiser criterion may lead to substantial overfactoring, and that the interpretation of scree-plots can be quite subjective (Fabrigar et al.,

1999), which explains some of this discrepancy. The goodness-of-fit revealed that none of the two-factor solutions were adequate. This means that although the two-factor solutions of the T-ERC showed resemblance to the original model at all timepoints, it was disfavored by fit-statistics and Kaisers criterion.

In the two-factor solutions of the P-ERC, positively scored ER-items mainly loaded on the same factor as reversed scored LN-items, whereas positively scored LN-items loaded on the same factor as reversed scored ER-items and item 12. Thus, the latent two-factor structure of the P-ERC reflected the valence of the items rather than different aspects of the ER-construct. Accordingly, the results of the exploratory analysis did not support the fit of Shields and Cicchetti's two-factor model in the Norwegian sample, as opposed to the validation of the Italian, French, Portuguese and Persian versions (Meybodi et al., 2018; Molina et al., 2014; Nader-Grosbois & Mazzone, 2015; Reis et al., 2016) of the ERC.

The fit of all three- and four-factor solutions were considered adequate with regards to TLI-, CFI- and RMSEA-values (except the three-factor solution of the T-ERC at age 12). Moreover, the three- and four-factor solutions of both the T- and P-ERC also seemed to indicate the positive or negative valence of the respective items. However, although the addition of a third or fourth factor substantively improved the fit of the respective solutions, it did not contribute to the solutions clarity or interpretability. As so, no meaningful alternative to Shields and Cicchetti's model were provided by the exploratory analysis.

The original authors have used the ERC both as a single criterion measure, in terms of the two-subscales ER and L/N, and as a three-factor structure (Curtis & Cicchetti, 2007; Shields & Cicchetti, 1997). The theoretical foundation for the use of different latent structures is unclear, and there is a shortage of recommendations for when to use the different operationalizations of the ERC. While the ERC is based on a clearly stated definition of the emotion regulation construct, the lack of theoretical underpinning of the subscales is evident. This makes the choice of ERC structure seem a bit coincidental.

The ERC treats emotion and emotion regulation as inseparable aspect of the same underlying process, as opposed to a two-factor solution with emotions preceding emotion regulation (Cole et al., 2004; Gross, 2014a). While some items include components of both emotion and its regulation (eg., item 11; "Can modulate excitement in emotionally arousing situations"), the ERC also includes items that merely inquire about emotional reactions (eg., item 10; "Takes pleasure in the distress of others"), as well as items that focus on regulation or the lack thereof (eg., item 2; "Exhibits wide mood swings"). As so, the ERC does not meet the two-factor definitions' demand of independent evidence of a) activated emotion and b)

purported regulatory strategies. In other words, the ERC can be criticized for failing to distinguish between emotion and emotion regulation (Cole et al., 2004; Gross, 2014a). In the exploratory analysis item 1 ("is cheerful") often loaded on the same factor as item 16 ("seems sad or listless") and item 18 (displays flat affect). But do these items reflect aspects of emotion regulation, or are they simply descriptions of the child's mood? If the items are reflections of the child's mood rather than its emotion regulation skills, one might question their appropriateness and usefulness.

Still, as mentioned in the introduction, the factorial and divergent validity of the ERC has previously been demonstrated in four diverse cultures. Due to differences in sampling methods (randomized versus convenient) and analytical approaches (treating data on a continuous versus ordinal scale, different fit criteria), some of the discrepancy demonstrated in this study could be attributed to method bias. Moreover, the results may imply cultural differences in the apprehension of emotion regulation as a construct (construct bias), the use of measurement scales (e.g. caused by ARS) or expectations and perceptions of children's emotion regulation and related behavior. For example, the relative low loadings of item 11 (Can modulate excitement) 17 (overly exuberant) and 23 (appropriate negative emotions) in the CFAs of the P-ERC could reflect different tolerance level for the child's display of negative emotions, excitement and energic behavior, between parent and teacher raters, but also between Norwegian raters and raters in other cultures and contexts. Besides, the consistently low loadings of item 20 ("is impulsive") across all raters and timepoints may point to impulsivity being regarded more of a descriptive behavioral term than an indication of lacking emotional control by Norwegian raters. Alternatively, it could point to a different degree of acceptance of children's impulsive behavior. Also, as discussed earlier, the ERC seems particularly vulnerable to acquiescence because of the clear valence of the items and factors of ERC. The results of the exploratory analysis strengthen this assumption, as the latent structure of the P-ERC in particular seems to be determined by the positive or negative valence of the items. In the following, I will discuss the results of the analysis of ASR amongst parent raters.

Discriminant Validity: ARS

The substantial correlation between the two subscales of the ERC and the newly constructed acquiescence scale supports the supposition that parent rated ERC in Norway is biased by ARS. As ARS is seen in relation to factor form invariance (Cheung & Rensvold, 2000), this can help explain the poor fit of the two-factor model in the Norwegian sample. On

the other hand, previous studies imply that country level differences in ARS is related to country levels of corruption and collectivism (He & van de Vijver, 2012; Rammstedt et al., 2017). In accordance with this, one would expect ARS to be less of a concern in the less corrupt and more individualistic Norwegian context than e.g. in Brazil or Iran, in wich factor form invariance for the ERC has previously been supported (Meybodi et al., 2018; Reis et al., 2016).

Strength and Limitations

This study had several strengths and some limitations. First, the use of randomized sampling methods and a high number of participants strengthens the generalizability of the results. Second, it treats the Likert-scale data on an ordinal level, thus avoiding potential sources of error such as incorrect test statistics (Brown, 2015). Third, the use of a confirmatory approach allowed testing of the fit of the original two-factor model in the Norwegian sample. However, although the fit was assessed by robust fit statistics (RMSEA, CFI, TLI) for different raters at different ages, no direct comparison between different timepoints has been conducted. Further, the valence of the respective items of the ERC was assumed, but not assessed in any ways. In addition, expert raters were asked to rate if the CBQ-items were; 1) "unambiguously positively formulated (refers to positive characteristics or behavior from the child)", 2) "negatively formulated (refers to negative characteristics or behavior from the child", or 3) "the statement is neutral or not unambiguously positive or negative, or non-categorizable". Alternative 2) should have read "*Unambiguously* positively (..)*",* to avoid alternative 1) being perceived as a stronger statement.

Since the ERC do not obtain any indicator of ARS, the operationalization of acquiescence relies on studies demonstrating the consistency of ARS across domains (Danner et al., 2015). If ARS were to be domain specific, a person tending to acquiescent responding on the CBQ would not be expected to equally attend to acquiescent responding on the ERC. Whereas this study gives an indication of parent ARS, it does not check for teacher ARS. Neither does it examine alternative sources of bias, such as extreme response style (the tendency to overuse either points of a response scale), social desirability, respondents' gender (neither teacher nor parent), parent psychopathology, or the gender of the child.

Practical implications

In sum, the Norwegian version of the ERC do not display factor form invariance compared to other analysis of the ERC. Violation of this basic test of measurement equivalence means that the instruments do not measure the same constructs. As follows, inference problems occur,

and conclusions drawn from using the Norwegian version of the ERC may be biased or invalid. Consequentially, there is still a lack of a psychometrically sound measurement tool for the assessment of emotion regulation in the Norwegian child population.

The specification search and the exploratory analysis failed to identify a theoretically sound alternative to the original two-factor solution of the ERC. In addition, attempts to construct a short-version of the ERC based on ER-items were unsuccessful. As so, further attempts to adapt the current version of the ERC to the Norwegian context seems futile. However, the results of this study should serve as a reminder of the importance of taking precautions against ARS. Provided the presumable consistency of acquiescence across domains, precautions against ARS should also be employed in other areas of developmental research with Norwegian parent respondents.

Conclusion

Conceptual equivalence in terms of factor form invariance and discriminate validity was not established for the Norwegian version of the ERC. Confirmatory factor analysis of both parent and teacher ratings in a large and representative sample of Norwegian children showed poor fit to the two-factor solution proposed by Shields and Cicchetti (1997) across childhood, and such a poor fit was also obtained for a one-factor solution. Moreover, the specification search failed to reveal meaningful model-alterations. Even further, explorative factor analyses did not identify any solutions with both acceptable fit and interpretability. Finally, the original two-factor solution was contaminated by parent's acquiescence, thus to a non-ignorable degree tapping into parents' propensity to endorse negatively worded statements about their child. This means that it cannot be determined whether observed differences in emotion regulation as assessed by the Norwegian ERC are caused by measurement artifacts or true differences in the population. Further work is needed to establish a valid and reliable measurement tool for the assessment of emotion regulation in Norwegian children.

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Appendix A

Table 1.

Factor Loadings from the Unconstrained Confirmatory Factor Analysis of Shields and Cicchetti's Two-Factor Model of the P-ERC at age 8, 10 and 12

	Item	Description	Loading [95% CI]		
			8 years (*n*= 659)	10 years (*n*= 691)	12 years (*n*= 653)
L/N	2	Mood swings	.73 [.68, .79]	.75 [.70, .80]	.73 [.67, .78]
	4	Transitions well	-.42 [-.50, -.34]	-.55 [-.62, -.48]	-.66 [-.72, .59]
	5	Recover Quickly	-.56 [-.63, -.50]	-.65 [-.71, -.59]	-.70 [-.76, -.64]
	6	Easily frustrated	.63 [.58, .68]	.72 [.67, .77]	.67 [.62, .73]
	8	Outbursts of anger	.77 [.72, .82]	.69 [.64, .75]	.74 [.68, .81]
	9	Able to delay gratification	-.46 [-.53, -.40]	-.47 [.54, -.40]	-.58 [-.65, .50]
	10	Pleased to see others distressed	.59 [.48, .70]	.52 [.40, .65]	.45 [.29, .61]
	11	Excitement modulation	**-.36 [-.44, -.28]**	**-.37 [-.45, -.29]**	-.44 [-.52, -.36]
	13	Disruptive outbursts of energy	.65 [.57, .73]	.74 [.66, .81]	.66 [.57, .75]
	14	Anger at limit-setting	.67 [.61, .72]	.61 [.54, .67]	.66 [.59, .72]
	17	Overly exuberant	.52 [.43, .60]	.46 [.37, .56]	**.37 [.24, .49]**
	19	Negativity towards peer-approach	.71 [.61, .81]	.62 [.51, .72]	.51 [.36, .66]
	20	Impulsivity	**.20 [.11, .30]**	**.17 [.08, .26]**	**.16 [.26, .25]**
	22	Intrusive exuberance	.64 [.56, .71]	.61 [.54, 68]	.45 [.34, .46]
	24	Negative emotions when engaging to play	.62 [.52, .71]	.52 [.41, .63]	.54 [.42, .66]
ER	1	Cheerful	.69 [.62, .76]	.70 [.64, .77]	.60 [.53, .67]
	3	Positive response to adult approaches	.65 [.58, .71]	.67 [.61, .73]	.77 [.72, .82]
	7	Positive to peer overtures	.73 [.66, .80]	.84 [.79, .90]	.81 [.75, .86]
	15	Manage talk about negative states	.59 [.52, .67]	.56 [.48, .63]	.55 [.47, .63]
	16	Seems sad	-.63 [-.72, -.53]	-.69 [-.76, -.61]	-.71 [-.78, -.63]
	18	Flat affect	-.53 [-.66, -.39]	-.65 [-.78, -.52]	-.68 [-.78, -.58]
	21	Empathy	.61 [.52, .69]	.64 [.57, 72]	.65, [.58, .73]
	23	Appropriate negative emotions	**.23 [.14, .32]**	**.37 [.29, .46]**	.42 [.34, .51]

Note. P-ERC = parent version of the Emotion Regulation Checklist; ER = Emotion Regulation; LN= Lability/Negativity; All loadings are significant, $p < .000$; loadings <.40 are printed in bold type.

Table 2.

Factor Loadings from the Unconstrained Confirmatory Factor Analysis of Shields and Cicchetti's Two-Factor Model of the T-ERC at age 8, 10 and 12

	Item	Description	Loading [95% CI]		
			8 years (*n*= 605)	10 years (*n*= 658)	12 years (*n*= 627)
L/N	2	Mood swings	.82 [.76, .88]	.83 [.77, .88]	.83 [.78, .88]
	4	Transitions well	-.62 [-.70, -.54]	-.60 [-.68, -.53]	-.64 [-.72, -.56]
	5	Recover Quickly	-.70 [-.75, -.65]	-.65 [-.71, -.60]	-.71 [-.76, -.65]
	6	Easily frustrated	.74 [.69, .78]	.74 [.69, .79]	.73 [.67, .78]
	8	Outbursts of anger	.76 [.69, .84]	.81 [.74, .87]	.83 [.76, .90]
	9	Able to delay gratification	-.62 [-.68, -.56]	-.50 [-.59, -.42]	-.57 [-.64, -.50]
	10	Pleased to see others distressed	.69 [.59, .78]	.60 [.51, .70]	.71 [.62, .80]
	11	Excitement modulation	-.53 [-.60, -.45]	-.51 [-.59, -.43]	-.62 [-.69, -.56]
	13	Disruptive outbursts of energy	.76 [.67, .84]	.66 [.55, .76]	.76 [.68, .85]
	14	Anger at limit-setting	.81 [.74, .87]	.87 [.79, .94]	.88 [.81, .96]
	17	Overly exuberant	.69 [.60, .78]	.65 [.55, .74]	.72 [.63, .80]
	19	Negativity towards peer-approach	.64 [.53, .74]	.74 [.66, .83]	.66 [.56, .76]
	20	Impulsivity	**.31 [.23, .40]**	**.31 [.23, .39]**	**.34 [.25, .42]**
	22	Intrusive exuberance	.77 [.69, .84]	.72 [.65, .79]	.74 [.67, .82]
	24	Negative emotions when engaging to play	.69 [.59, .78]	.70 [.60, .80]	.67 [.58, .76]
ER	1	Cheerful	.61 [.55, .68]	.77 [.72, .81]	.70 [.65, .75]
	3	Positive response to adult approaches	.78 [.73, .84]	.74 [.69, .80]	.81 [.77, .85]
	7	Positive to peer overtures	.88 [.83, .92]	.78 [.72, .84]	.85 [.80, .89]
	15	Manage talk about negative states	.57 [.51, .64]	.54 [.47, .61]	.54 [.47, .61]
	16	Seems sad	-.78 [-.84, -.72]	-.77 [-.83, -.72]	-.76 [-.82, -.71]
	18	Flat affect	-.76 [-.83, -.69]	-.72 [-.79, -.65]	-.72 [-.79, -.65]
	21	Empathy	.74 [.68, .79]	.69 [.63, .76]	.70 [.64, .76]
	23	Appropriate negative emotions	.51 [.43, .58]	.57 [50, .63]	.80 [.72, .88]

Note. T-ERC= Teacher version of the emotion regulation checklist; ER = Emotion Regulation; LN= Lability/Negativity. All loadings are significant, $p < .000$; loadings <.40 are printed in bold type

Appendix B

Table 1.

Model summary of Confirmatory Factor Analysis of the P-ERC and T-ERC at age 8, 10 and 12

Model	*df*	X^2	CFI	TLI	RMSEA [90% CI]
			P-ERC		
			8 years		
M1, Shield & Cicchetti's original model	229	988.4	.855	.840	.071 [.066, .076]
M2, composite ERC score	252	1255.6	.818	.801	.078 [.073, .082]
			10 years		
M1, Shield & Cicchetti's original model	229	1162.0	.840	.824	.077 [.0.72, .081]
M2, composite ERC score	252	1492.6	.796	.777	.084 [.080, .089]
			12 years		
M1, Shield & Cicchetti's original model	229	1094.9	.826	.808	.076 [.072, .081]
M2, composite ERC score	252	1449.2	.765	.743	.085 [.081, .090]
			T-ERC		
			8 years		
M1, Shield & Cicchetti's original model	229	1065.6	.880	.867	.078 [.073, .082]
M2, composite ERC score	252	1484.3	.830	.814	.090 [.086, .094]
			10 years		
M1, Shield & Cicchetti's original model	229	1184.0	.854	.839	.080 [.075, .084]
M2, composite ERC score	252	1675.4	.790	.770	.093 [.088, .097]
			12 years		
M1, Shield & Cicchetti's original model	229	1191.5	.874	.861	.082 [.077, .086]
M2, composite ERC score	252	1794.6	.798	.778	.099 [.095, .103]

Note. P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist; ERC = Emotion Regulation Checklist; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean square error of approximation

Appendix C

Table 1.

Exploratory factor analysis: Eigenvalues from the Sample Correlation Matrix for P-ERC and T-ERC at age 6-12 years

	P-ERC				T-ERC			
Factor number	6 yrs	8 yrs	10 yrs	12 yrs	6 yrs	8 yrs	10 yrs	12 yrs
1	6.794	7.311	7.439	7.397	8.259	9.604	9.344	9.655
2	2.719	2.525	2.855	2.690	3.092	2.774	3.023	3.370
3	1.859	1.799	1.962	2.091	1.772	1.773	1.977	1.698
4	1.493	1.402	1.225	1.442	1.244	1.129	1.085	1.230
5	1.237	1.151	1.197	1.293	1.130	1.065	.996	.937
6	1.032	.997	0.935	1.053	.880	.996	.928	.808
7	.958	.921	.906	.968	.798	.849	.806	.745
8	.806	.799	.802	.814	.782	.756	.738	.670

Note. P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist

Appendix D

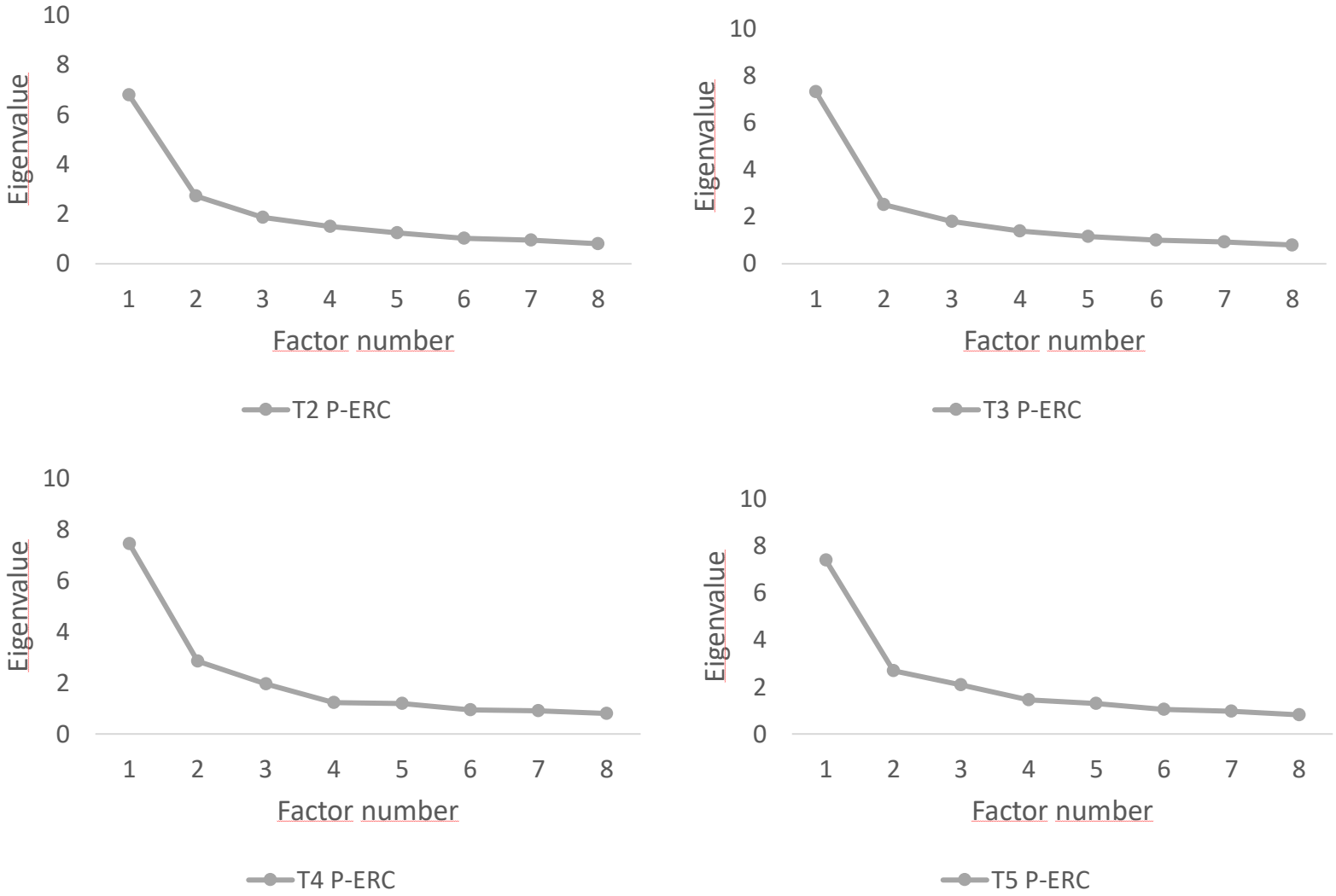


Figure a. Scree Plot of Eigenvalues from the Sample Correlation Matrix of EFA of the P-ERC at T2-T5

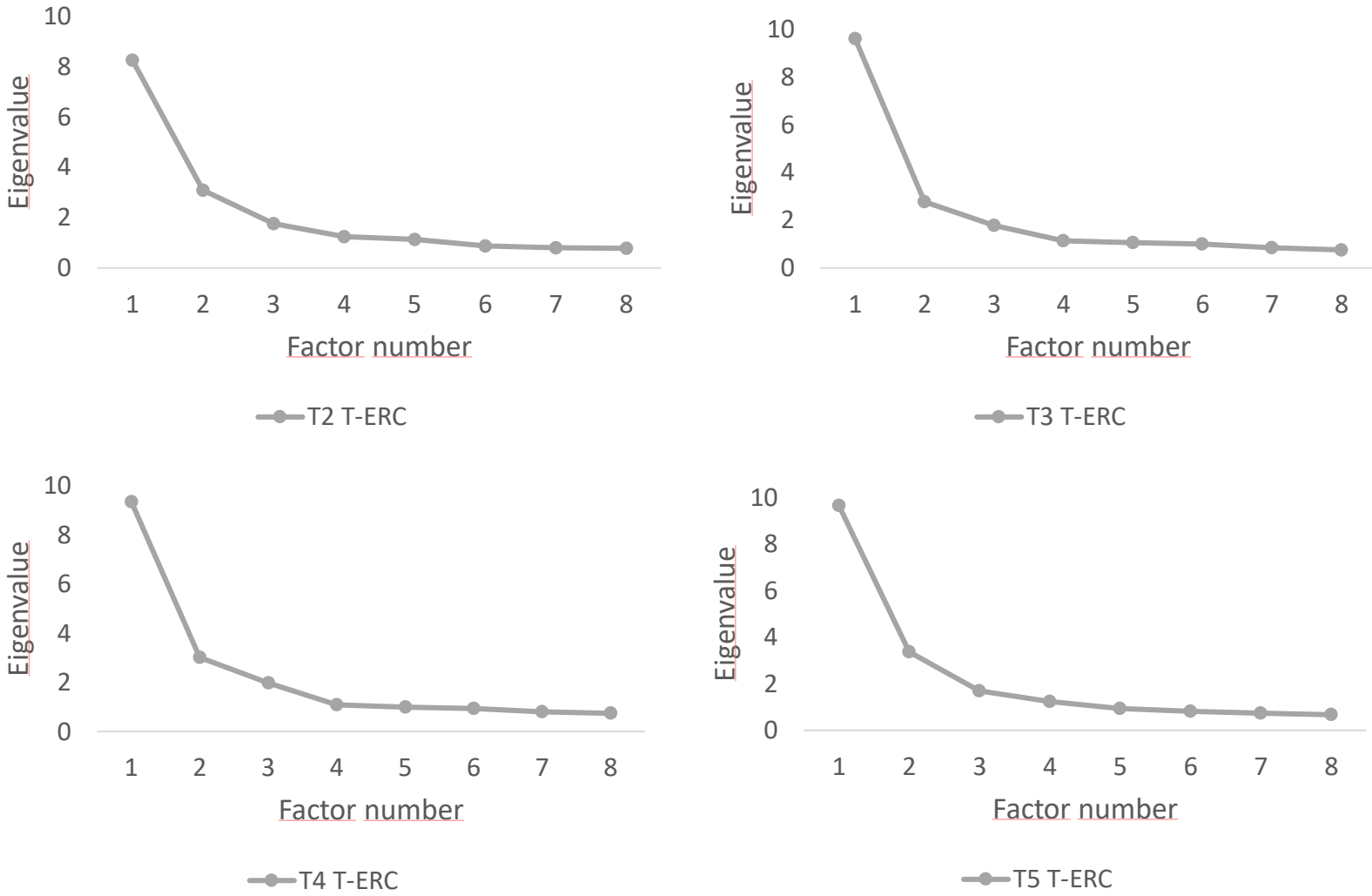


Figure b. Scree Plot of Eigenvalues from the Sample Correlation Matrix of EFA of the T-ERC at T2-T5

Appendix E

Table 1.

Model summary of Exploratory Factor Analysis of the P-ERC and T-ERC at age 8, 10 and 12

		P-ERC				T_ERC			
Factors	*df*	x^2	CFI	TLI	RMSEA [90% CI]	x^2	CFI	TLI	RMSEA [90% CI]
8 years (n = 605)									
2	229	646.9	.924	.909	.053 [.048, .057]	833.0	.917	.900	.066 [.061, .071]
3	207	382.6	.968	.958	.036 [.030, .041]	485.1	.962	.949	.047 [.042, .053]
4	186	267.8	.985	.978	.026 [.019, .032]	378.0	.974	.961	.041 [.035, .047]
5	166	210.9	.992	.987	.020 [.010, .028]	308.5	.980	.967	.038 [.031, .044]
6	147	179.6	.994	.989	.018 [.005, .027]	247.4	.986	.974	.034 [.026, .041]
10 years (n = 658)									
2	229	673.7	.927	.912	.053 [.048, .058]	876.3	.905	.885	.066 [.061, .070]
3	207	376.3	.972	.963	.034 [.029, .040]	442.4	.965	.954	.042 [.036, .047]
4	186	383.3	.984	.976	.028 [.021, .034]	349.1	.976	.964	.037 [.031, .042]
5	166	214.2	.992	.987	.021 [.011, .028]	266.9	.985	.975	.030 [.023, .037]
6	147	175.8	.995	.991	.017 [.000, .026]	193.4	.993	.987	.022 [.012, .030]
12 years (n = 627)									
2	229	856.9	.877	.852	.065 [.060, .069]	791.3	.926	.911	.063 [.058, .067]
3	207	507.2	.941	.922	.047 [.042, .052]	463.2	.966	.955	.044 [.039, .050]
4	186	368.8	.964	.947	.039 [.033, .045]	325.8	.982	.973	.035 [.028, .041]
5	166	274.0	.979	.965	.032 [.025, .038]	254.3	.988	.981	.029 [.022, .036]
6	147	206.5	.988	.978	.025 [.016, .033]	197.0	.993	.988	.023 [.014, .031]

Note. P-ERC = Parent version of the Emotion Regulation Checklist; T-ERC = Teacher version of the Emotion Regulation Checklist; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean square error of approximation

Appendix F

Table 1.

Exploratory Analysis of the P-ERC at age 6 (n = 753)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	**.49***	-.18*	**.48***	-.01	**-.43**	**.48***	-.02	**-.48***	-.05	**.42***	-.37*	.10	-.38*	-.04	**.59***	-.38*	-.03	.16	-.07	.02
2	-.05	**.72***	-.03	**.60***	**.41***	-.07	**.59***	**.40***	.01	-.07	**.68***	.14*	-.01	-.02	-.10	**.66***	-.02	.15	-.04	.09
3	**.74***	.11*	**.75***	.18*	-.07	**.73***	.13*	-.16*	.05*	**.69***	.05	-.03	-.30*	.04	**.70***	.06	.21	.02	-.03	.01
4	**.54***	-.15*	**.57***	-.15*	.09	**.59***	-.20*	.03	.14*	**.57***	-.04	-.20*	.00	.12*	**.43***	.01	.33*	-.23*	.06	-.08
5	**.59***	-.21*	**.61***	-.17*	-.03	**.59***	-.20*	-.10	-.01	**.57***	-.16*	-.14*	-.07	-.02	**.45***	-.14	.29	-.11	-.07	-.02
6	.04	**.66***	.07	**.52***	**.49***	.01	**.52***	**.47***	-.04	.02	**.73***	.05	.05	-.07	-.09	**.71***	.08	.09	-.11	.08
7	**.79***	-.01	**.81***	.05	-.01	**.79***	-.01	-.10	.03	**.75***	-.06	-.03	-.13	.02	**.61***	-.05	.37	-.04	00	.02
8	-.03	**.68***	-.01	**.55***	**.44***	.02	**.51***	**.44***	.22*	.01	**.73***	-.03	-.07	.22*	.07	**.81***	-.05	-.05	.10.	-.04
9	**.53***	-.13*	**.58***	-.17*	.22*	**.54***	-.20*	.16*	-.01	**.59***	-.10	-.04	.27*	.05	.20	-.05	**.56***	-.14	.10	-.05
10	-.13	**.47***	-.17	**.46***	.02	-.03	**.41***	.03	**.44***	-.06	.23	.27	-.08	**.45***	.04	.32	-.05	.14	**.46***	-.22
11	**.48***	.03	**.52***	-.09	**.42***	**.44***	-.11*	.35*	-.11	**.52***	.04	.03	**.46***	-.05	-.02	.07	**.65***	-.10	.06	.04
12	.02	**.50***	.01	**.46***	.16*	-.04	**.48***	.16*	-.13	-.03	.33*	.29*	.02	-.14	.07	.12	-.21	.01	.00	**.78***
13	.05	**.78***	.02	**.82***	-.03	-.01	**.83***	-.03	-.07	-.02	.31*	**.62***	-.17	-.05	-.03	.31	-.01	**.63***	.04	.02
14	-.02	**.60***	-.01	**.51***	.30*	-.01	**.49***	.30*	.11	-.01	**.52***	.15*	.00	.09	.03	**.47***	-.07	.00	.13	.20
15	**.59***	.02	**.62***	.01	.13*	**.51***	.02	.05	-.29*	**.53***	-.01	.03	.06	-.27*	.23	-.01	**.43***	.13	-.25	.05
16	-.09	**.50***	-.07	**.41***	.29*	-.06	**.40***	.29*	.10	-.02	.31*	.33*	.27*	.11	-.14	.22	.06	-.03	.33*	.34
17	.06	**.54***	.00	**.62***	-.25*	-.02	**.65***	-.26*	-.12	-.03	-.05	**.69***	-.16	-.08	.12	-.06	-.02	**.69***	.06	.02
18	-.15	**.48***	-.19	**.46***	.01	-.06	**.42***	.03	.39*	-.02	-.10	**.64***	.35	**.42**	.25*	-.15	.06	.06	**.76***	.30
19	-.04	**.51***	-.08	**.51***	.01	.05	**.45***	.00	**.46***	.06	.12	**.44***	.05	**.49***	.12	.14	-.05	.05	**.62***	.09
20	.18*	**.39***	-16	**.50***	-.22*	.19*	**.49***	-.25*	.06	.15*	.03	.39*	-.30	.08	.25*	.09	-.02	**.49***	.06	-.17*
21	**.59***	-.02	**.62***	-.01	.10	**.48***	.04	.02	**-.51***	**.50***	.00	.04	.01	**-.50***	.17	-.03	**.43***	.26*	**-.48***	.06
22	.07	**.63***	.01	**.70***	-.21*	.01	**.72***	-.22*	-.04	.00	.05	**.68***	-.17	-.01	-.01	.06	.01	**.69***	.12	-.04
23	**.49***	.14	**.55***	.02	**.49***	**.43***	.00	**.41***	-.20*	**.49***	.21*	-.01	.37*	-.16	-.05	.26	**.66***	.02	-.14	-.04
24	-.02	**.47***	-.05	**.47***	.02	.02	**.43***	.01	.24*	.03	.07	**.47***	.11	.26*	.04	.02	-.03	.10	**.46***	.25

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. P-ERC = Parent version of the Emotion Regulation checklist.

Table 2.

Exploratory Analysis of the P-ERC at age 8 (n = 659)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	**.46***	-.26*	**-.55***	.02	**.52***	.37*	-.30*	-.02	**-.42***	.26*	-.30*	-.01	**-.49***	.24*	-.17	.25*	-.08	**-.57***	.24*	.03
2	-.04	**.74***	**.73***	-.05	.04	-.07	**.70***	.09	-.07	-.07	**.71***	.01	.02	.13	**.72***	-.07	-.01	.01	.10	.01
3	**.70***	.04	-.09	.40*	**.49***	**.65***	.01	.02	-.19*	**.56***	.01	.00	-.37*	.06	.03	**.55***	.05	-.44*	.07	-.13
4	.33*	-.19*	-.17*	.28*	.13*	.32*	-.15*	-.08	.00	.27*	-.16*	-.03	-.14	-.09	-.06	.27*	-.12	-.22*	-.10	.14
5	**.51***	-.20-	-.27*	.31*	.33*	**.53***	-.27*	.08	-.04	**.47***	-.28*	.07	-.20	.00	-02	**.47***	-.02	-.28*	.01	.13
6	.01	**.67***	**.66***	.00	.05	.16	**.59***	.16*	.00	.00	**.61***	-.08	.13	.15*	**.61***	.00	-.10	.13	.12	-.01
7	**.83***	.07	.01	**.58***	**.49***	**.82***	.01	.07	-.07	**.69***	.01	-.10	-.24	.02	-01	**.70***	.00	-.17	.04	-.22
8	.02	**.80***	**.86***	.01	-.01	-.03	**.83***	-.01	-.03	-.02	**.82***	.00	-.01	.02	**.85***	-.03	-.03	-.02	-.02	.04
9	**.44***	-.13*	.04	**.54***	.05	**.47***	-.02	-.10	.19*	**.41***	-.06	-.13	.01	-.23*	-.03	**.41***	-.15	-.01	-.23*	.04
10	-.33*	.38*	.28*	-.37*	-.05	-.29*	.21*	.25*	.00	-.08	.17	**.66***	-.07	-.02	.04	-.02	**.89***	.01	.01	-.03
11	**.40***	-.04	.23*	**.64***	-.08	**.50***	-.02	-.01	**.41***	**.51***	-.04	.03	.17	-.38	-.02	**.51***	-.02	.15	-.37*	.12
12	-.21*	**.49***	.38*	-.30*	.04	-.13	.22	**.41***	.07	-.09	.23*	.11	.27*	.25	.29*	-.10	-.04	.21*	.25*	.17
13	.02	**.70***	**.51***	-.23	.27*	.04	**.46***	.38*	-.17	.04	**.46***	.17	-.01	.33	**.49***	.04	.13	.00	.33*	.00
14	.08	**.76***	**.84***	.16	.00	.05	**.78***	.01	.02	.10	**.78***	.14	-.06	-.07	**.77***	.09	.15*	-.01	-.09	-.02
15	**.62***	-.01	.04	**.55***	.27*	**.62***	.02	-.05	.03	**.48***	.04	-.35*	-.04	.00	.03	**.49***	-.28	-.02	-.01	-.17
16	-.27*	**.40***	**.57***	.00	-.26*	.02	.08	**.54***	**.57***	.07	.09	.02	**.77***	.01	.02	.08	-.02	**.78***	.04	.06
17	-.08	**.49***	.02	**-.59***	**.43***	.01	-.07	**.72***	-.17	.03	-.07	.35	.07	**.56***	-.02	.02	.25	.06	**.60***	.06
18	-.30*	.29*	**.49***	.09	-.32*	-.01	-.17	**.59***	**.55***	.01	-.14	.00	**.75***	.08	.22	.02	.01	**.77***	.11	.02
19	-.23*	**.59***	**.54***	-.24*	-.03	-.13	.37*	.37*	-.13	-.03	.35*	.34*	.20	.07	**.58***	-.04	.00	-.02	.04	**.58***
20	.14*	.33*	-.06	-.35*	**.50***	.14	.03	.39*	-.35*	.04	.05	-.10	-.09	**.62***	.02	.03	-.03	-.02	**.64***	-.28*
21	**.57***	-.07	-.01	**.52***	.23*	**.57***	-.01	-.09	.02	**.41***	.21	**-.50***	.03	.04	.02	**.41***	**-.41***	.02	.01	-.18
22	-.13	**.60***	.12	**-.66***	**.41***	-.05	.03	**.75***	-.17	-.03	.03	.33	.13	**.60***	.07	-.04	.23	.11	**.64***	.05
23	**.48***	.23*	**.50***	**.69***	.02	**.58***	.31*	-.03	.30*	**.55***	.30*	.01	.05	-.32	.28*	**.56***	.06	.08	-.32*	-.01
24	-.17*	**.55***	.34*	-.38*	.15	-.04	.15	**.59***	.09	.08	.12	**.49***	.19	.21	.28	.05	.16	.04	.24*	**.45***

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. P-ERC = Parent version of the Emotion Regulation checklist.

Table 3.

Exploratory Analysis of the P-ERC at age 10 (n = 691)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	**.48***	-.29*	**.41***	**-.43***	.18*	.39*	-.33*	.08	-.25*	.36*	-.35*	.08	-.26*	-.12	-.23*	.07	**.42***	.03	-.30*	.04
2	-.08	**.74***	-.01	**.77***	.13	-.01	**.59***	.26*	.11	.01	**.57***	.21*	.04	.20*	**.63***	.03	-.01	.18*	.06	-.11
3	**.80***	.17*	**.77***	.07	.01	**.78***	.24	.00	-.11	**.74***	.13	-.04	-.21	.03	.07	**.69***	.07	-.02	-.09	.04
4	**.50***	-.15*	**.49***	-.16*	-.19*	**.56***	-.14	-.03	.15*	**.55***	-.22*	-.10	.06	.12	-.01	.14	**.49***	-.19*	.07	.05
5	**.52***	-.26*	**.47***	-.36*	.01	**.53***	-.39*	.14*	.03	**.51***	**-.46***	.09	-.03	.08	-.26*	.05	**.62***	.03	-.03	-.01
6	-.06	**.73***	.003	**.80***	.00	.00	**.81***	.00	.04	.00	**.80***	.02	.00	.03	**.75***	.23*	-.31*	.00	.02	.02
7	**.94***	.10	**.91***	-.01	-.03	**.93***	.16	.00	-.08	**.89***	.03	-.04	-.20	.03	-.05	**.94***	.05	-.02	-.05	-.01
8	-.04	**.71***	.01	**.71***	.17*	-.03	**.69***	.12	-.13	-.05	**.69***	.12	-.15*	.02	**.78***	-.04	.00	.08	-.20*	-.03
9	**.47***	-.10	**.52***	-.02	**-.42***	**.64***	-.05	-.11	**.44***	**.56***	-.08	-.13	.37*	-.04	-.05	.19	.21	-.12	**.40***	.37*
10	-.10	**.49***	-.03	**.54***	.04	-.03	**.42***	.15	.11	.05	.35*	.04	-.05	**.40***	**.54***	.03	.23	-.05	.00	-.36*
11	**.44***	-.01	**.46***	.06	-.36*	**.57***	-.03	-.02	**.41***	**.47***	-.04	-.02	.38	-.09	.05	.00	.30*	-.04	.37*	**.43***
12	.01	**60***	.03	**.57***	.21*	.05	-30*	**.40***	.13	.03	.31*	.38*	.12	.10	.33*	.00	.01	.37*	.13	.00
13	.06	**.83***	.01	**.65***	**.58***	-.01	.27*	**.71***	-.04	-.06	.31*	**.74***	.02	-.04	.30*	-.04	-.05	**.72***	.00	.04
14	.01	**.67***	.07	**.69***	.11	.05	**.63***	.15	.00	.03	**.64***	.17*	-.01	.00	**.67***	.02	-.04	.13	-.03	.06
15	**.57***	-.03	**.54***	-.11	.01	**.56***	-.04	.05	-.05	**.44***	.02	.19	.03	**-.46***	.01	.06	.21	.17	-.06	**.55***
16	-.27*	**.48***	-.16*	**.61***	-.16*	-.03	.18	.33*	**.65***	.01	.14	.18	**.53***	**.46***	.20	-.06	.00	.20	**.63***	-.11
17	.01	**.53***	-.03	-.11	**.51***	-.04	-.05	**.68***	.00	-.01	-.08	**.60***	-.04	.27	-.01	.01	.13	**.58***	.01	-.30*
18	**-.47***	.24*	-.33*	**.47***	-.38*	-.19	.02	.13	**.74***	-.17	.01	.02	**.67***	.39*	-.01	-.18	-.13	.07	**.75***	-.02
19	**-.40***	.33*	-.34*	**.42***	-.03	-.35*	.33*	.01	.13	-.28*	.30*	-.07	.05	.30*	**.41***	-.20	.02	-.12	.06	-.28*
20	.18*	.33*	.14*	.19*	.38*	.12	.04	**.41***	-.14	.08	.06	**.43***	-.11	-.08	.12	-.08	.19	**.40***	-.16	.04
21	**.63***	-.05	**.60***	-.13*	-.03	**.63***	-.07	.04	-.01	**.54***	-.07	.09	.00	-.25*	-.11	.31*	.14	.10	.01	.34*
22	.08	**.70***	-.01	**.45***	**.64***	-.02	-.02	**.83***	-.03	-.03	.00	**.76***	-.02	.13	-.03	.08	-.04	**.78***	.02	-.18
23	**.44***	.03	**.47***	.09	-.31*	**.55***	.10	-.09	.28*	**.45***	.12	-.04	.29*	-.21	.04	.24*	-.02	-.1	.30*	**.46***
24	-.20*	**.41***	-.16*	**.44***	.10	-.13	.19	.27*	.19	.00	.06	.10	.01	**.61***	.15	.26	-.01	.08	.15	**-.61**

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. P-ERC = Parent version of the Emotion Regulation checklist.

Table 4.

Exploratory Analysis of the P-ERC at age 12 (n = 653)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	**.53***	-.09	**.45***	-.02	**-.50***	.38*	-.14	.17*	**-.49***	-.23*	.22*	.14	.14	**-.49***	-.17	.27*	.09	**-.52***	.16	.03
2	-.12*	**.69***	-.11*	**.65***	.21	-.15*	**.68***	.03	.06	**.68***	.26*	-.09	.02	.15	**.64***	.20*	-.01	.23	.02	-.09
3	**.87***	.18*	**.87***	.21*	-.07	**.83***	.28*	-.03	-.15	.03	**.59***	**.61***	-.07	-.08	.03	**.64***	**.69***	.01	.03	.02
4	**.57***	-.16*	**.60***	-.14	.06	**.58***	.09	-.28*	-.06	.05	.09	**.46***	-.30*	-.23*	.00	.13	**.59***	-.17	-.20*	-.11
5	**.55***	-.24*	**.57***	-.22*	.00	**.57***	-.09	-.17*	-.05	-.12	-.01	**.45***	-.18*	-.25*	-.11	.01	**.46***	-.26*	-.13	.02
6	.00	**.76***	.01	**.72***	.21	-.03	**.74***	.06	.05	**.73***	.24*	.01	.07	.09	**.82***	.10	-.14	.04	-.04	.20
7	**.89***	.16	**.91***	.19	.02	**.89***	.24	-.02	-.05	-.01	**.45***	**.68***	-.05	-.04	.03	**.40***	**.64***	-.05	.00	.14*
8	.01	**.80***	.01	**.77***	.21	-.04	**.84***	.03	-.01	**.94***	.04	-.02	.02	-.16	**.89***	-.03	.02	-.10	.02	-.11
9	**.44***	-.20*	**.50***	-.22*	.29*	**.56***	-.09	-.18*	.30*	-.12*	-.02	**.56***	-.19*	.13	-.18*	.01	**.63***	.18*	-.10	.00
10	-.36*	.16	-.37*	.14	.05	**-.40***	.23	-.08	-.05	.35*	-.24	-.32	-.06	-.12	.22*	-.18	-.07	.01	.03	-.38*
11	**.44***	-.03	**.51***	-.03	.29*	**.59***	-.03	.00	.36*	.02	-.20	**.62***	.00	.03	-.03	-.21	**.61***	.03	.06	.02
12	.03	**.63***	.02	**.62***	.05	.08	.26*	**.49***	.24*	.31*	-.06	.18	**.50***	.13	.31*	-.13	.05	.10	**.46***	.06
13	-.02	**.73***	-.12	**.73***	-.24	-.10	.24	**.66***	-.02	.30*	-.05	-.06	**.67***	-.07	.24*	-.03	-.01	.00	**.70***	-.21*
14	-.02	**.72***	.01	**.70***	.23	.02	**.59***	.21*	.20*	**.69***	-.10	.13	.23*	.03	**.67***	-.19	.06	.02	.19*	.00
15	**.54***	.00	**.54***	.03	-.10	**.57***	-.18*	.25*	.03	-.20*	-.04	**.50***	.25*	-.17	-.04	-.14	.18	-.37	.15*	36*
16	**-.49***	.28*	-.37*	.25*	**.47***	-.25	.14	.14	**.57***	.11	.11	-.01	.17	**.77***	.09	.03	-.03	**.76***	.13	.09
17	.11	**.51**	-.01	**.48***	-.36*	-.02	.01	**.59***	-.15	-.07	.28*	-.05	**.59***	.04	-.04	.27*	-.12	.04	**.56***	.02
18	**-.65***	.04	**-.48***	-.01	**.56***	-.36*	-.03	-.01	**.63***	-.03	-.01	-.14	-.01	**.78***	-.16	-.01	.03	**.89***	.04	-.11
19	-.27*	.32*	-.24*	.30*	.21	-.14	.02	.35*	.39*	.11	-.19	.04	.36*	.34*	.08	-.24*	-.01	.31*	.34	.01
20	.16*	.31*	.05	.33*	-.39*	-.01	.12	.31*	-.38*	.12	.08	-.13	.30*	-.39*	.16	.09	-.19*	**-.40***	.28*	-.03
21	**.61***	-.05	**.62***	-.02	-.05	**.66***	-.16	.17*	.05	-.28	.18	**.56***	.16*	-.01	-.02	.03	.02	-.27	-.01	**.84***
22	.13	**.63***	.00	**.64***	**-.45***	-.00	.00	**.80***	-.17	.02	.08	-.04	**.78***	-.15	-.04	.14	.00	-.09	**.84***	-.20
23	**.46***	.05	**.53***	.04	.30*	**.60***	.05	.00	.34*	.08	-.11	**.62***	-.01	.06	.08	-.15	**.55***	.02	.01	.10
24	-.19*	**.42***	-.27*	**.40***	-.18	-.25*	.01	**.47***	.01	.02	.07	-.19*	**.47***	.14	.07	.02	-.32*	.08	**.41***	.08

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. P-ERC = Parent version of the Emotion Regulation checklist.

Table 5.

Exploratory Analysis of the T-ERC at age 6 (n = 753)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	**.79***	.20*	**.66***	.20*	-.30*	-.26*	**.42***	.24*	-.39*	**.41***	-.01	**-.43***	.30*	.02	.02	.19	**.71***	.23*	-.04	-.04
2	-.36*	**.60***	.01	**.63***	**.65***	**.71***	.04	**.47***	.05	.03	**.72***	.30	-.02	.26	**.82***	.00	-.04	-.06	.34*	-.07
3	**.73***	.03	**.78***	.07	.04	.00	**.65***	.09	-.22	**.66***	-.15	-.01	.22*	.21*	-.04	.29*	**.56***	.07	.28*	.01
4	.39*	-.24*	**.45***	-.22*	.08	-.08	**.53***	-.13	.13	**.53***	.04	-.02	-.22*	-.11	.03	**.44***	.11	-.23*	-.03	.07
5	**.61***	-.15*	**.53***	-.14*	-.20*	-.38*	**.55***	.02	.05	**.57***	-.07	-.20	.02	-.27*	-.10	**.53***	.26*	.00	-.19	-.03
6	-.29*	**.53***	-.02	**.55***	**.50***	**.54***	.13	**.43***	.05	-.01	**.55***	.25	.05	.21	**.59***	-.06	-.07	.05	.26*	.01
7	**.75***	-.03	**.78***	.00	.00	-.13*	**.73***	.09	-.08	**.75***	-.10	-.03	.14	.01	-.04	**.48***	**.44***	.03	.12	.02
8	-.26*	**.62***	-.10	**.62***	.33*	.38*	-.09	**.53***	.04	-.13	**.72***	-.02	.03	-.01	**.71***	.01	-.03	.08	-.01	-.09
9	.33*	-.31*	**.43***	-.29*	.17*	-.02	**.57***	-.20*	.22	**.57***	.02	.10	-.31*	-.11	.02	**.48***	.00	-.31*	.01	.09
10	-.28*	**.49***	-.30*	**.48***	.01	-.02	-.19	**.51***	.21	-.19	.33*	.01	.26*	-.23	.19	.00	-.36*	.39*	-.17	.04
11	.32*	-.25*	**.44***	-.11*	.21*	.03	**.57***	-.14	.21	**.56***	.06	.12	-.27	-.06	.05	**.44***	.01	-.27*	.06	.10
.12	-.25*	.36*	-.01	**.40***	**.42***	**.50***	-.02	.28*	-.02	-.02	.03	**.50***	.31*	**.52***	.13	-.30*	.01	.22	**.62***	.01
13	.00	**.79***	.02	**.80***	.06	.10	-.01	**.78***	-.10	-.01	**.46***	.03	**.50**	-.03	.35*	-.01	-.01	**.58***	.00	.02
14	-.22*	**.68***	.00	**.69***	**.40***	**.47***	-.04	**.57***	-.03	-.04	**.83***	-.02	.01	.04	**.82***	.00	.00	.07	.01	.04
15	**.57***	-.05	**.70***	.00	.19*	.26*	**.55***	-.06	-.31	**.55***	.00	-.02	-.02	.38*	.00	.07	**.45***	-.06	.28*	.26*
16	**-.78***	-.01	**-.40***	.02	**.65***	**.46***	-.05	.01	**.57***	-.07	.00	**.85***	-.06	.14	.04	-.01	**.72***	-.07	**.40***	.00
17	.07	**.71***	.04	**.71***	-.05	-.07	.05	**.75***	.06	.080	.01	.28*	**.78***	.01	-.08	.02	-.06	**.81***	.18	-.09
18	**-.74***	-.10	**-.44***	-.06	**.50***	.20	.01	.02	**.75***	-.01	-.15	**.87***	-.01	-.11	-.18	.18	**-.90***	.03	.24	-.03
19	-.36*	**.41***	-.28*	**.41***	.18	.20	.01	**.50***	**.47***	.01	.24	**.41***	.26	-.24	.11	.20	**.55***	.37*	-.02	-.01
20	.30*	**.68***	.27*	**.69***	-.06	-.03	.18*	**.70***	-.12	.17	.35*	-.13	**.49***	-.03	.21	.06	.18*	**.58***	-.05	.09
21	**.61***	-.22*	**.63***	-.21*	-.02	.03	**.45***	-.23*	-.33	**.46***	-.25*	-.12	-.01	.30*	-.19	.05	**-.52***	-.10	.22*	.16*
22	.05	**.86***	-.01	**.88***	-.10	-.01	-.10	**.85***	-.10	-.11	.33*	-.03	**.68***	.00	.21	-.13	.07	**.75***	.01	-.02
23	**.47***	-.07	**.60***	-.02	.23*	.21*	**.53***	-.05	-.14	**.53***	.15	-.04	-.15*	.20*	-.03	.00	.00	.03	-.02	**1.02***
24	-.33*	**.43***	-.26*	**.44***	.16	.10	-.10	**.45***	.27*	-.11	.13	.38*	.34*	-.04	.00	-.05	**-.44***	**.44***	.09	.07

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. T-ERC = Teacher version of the Emotion Regulation checklist.

Table 6.

Exploratory Analysis of the T-ERC at age 8 (n = 605)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	.05	**.68***	-.02	**.42***	**-.45***	.34*	-.31*	.17	**-.44***	.31*	-.12	.12	.27*	**-.49***	.30*	-.12	.14	**-.51***	.07	.20
2	**.69***	-.25*	**.83***	.03	.17	.02	**.57***	**.43**	.19*	-.06	**.78***	.02	.00	.19*	-.07	**.77***	.02	.13	-.01	.10
3	-.12	**.73***	.10	**.83***	-.09	**.73***	-.28*	.16*	-.07	**.48***	.01	**.46***	.13	-.10	**.47***	.01	**.47***	-.13	.01	.14
4	-.35*	.37*	-.20*	**.49***	.10	**.44***	**-.40***	-.05	.16*	**.62***	-.02	.07	-.16	.03	**.63***	.01	.07	-.01	-.21*	.02
5	**-.42***	**.41***	-.36*	**.41***	-.01	.37*	**-.50***	-.10	.04	**.60***	-.27*	-.01	-.06	-.07	**.59***	-.27*	.00	-.06	-.03	-.05
6	**.68***	-.16*	**.75***	-.03	.01	-.04	**.37***	**.52***	.10	.02	**.62***	-.13	.14	.06	.01	**.62***	-.11	-.01	.04	.21*
7	-.25*	**.71***	.00	**.88***	.04	**.78***	-.24*	.00	.01	**.43***	-.01	**.57***	.00	-.01	**.45***	-.04	**.57***	.02	.12	-.10
8	**.74***	-.10	**.79***	.01	.02	-.03	**.52***	**.44***	.00	.01	**.82***	-.13	-.01	-.10	.01	**.78***	-.13	-.12	.09	.00
9	-.36*	.35*	-.11	**.63***	.29*	**.58***	.01	-.25*	.16*	.15	.02	**.59***	-.20	.23*	.15	-.02	**.56***	.25*	-.04	-.21
10	.38*	**-.41***	.30*	**-.44***	.01	-.37*	-.05	**.41***	.21	.11	.12	**-.53***	.21	.13	.12	.09	**.50***	.17	.31*	.04
11	-.34*	.27*	-.03	**.61***	.36*	**.56***	-.08	-.13	.31*	.31*	.04	**.45***	-.18	.32*	.32*	.04	**.43***	.32*	-.05	-.14
12	**.70***	.03	**.69***	-.02	-.23*	-.03	.16	**.62***	-.05	-.29*	.05	.11	**.62***	.07	-.33*	.06	.17	-.01	.18	**.56***
13	**.81***	.00	**.80***	-.05	-.24*	-.06	.21	**.71***	-.07	-.17	.29*	-.03	**.56***	-.03	-.15	.20	-.01	.05	**.60***	.16
14	**.80***	-.09	**.89***	.07	.04	.03	**.53***	**.53***	.04	-.08	**.75***	.01	.13	.01	-.05	**.71***	.00	.02	.27*	-.02
15	-.03	**.58***	.20*	**.71***	-.10	**.63***	.01	.10	-.15*	.05	-.05	**.63***	.24*	-.07	.04	-.05	**.64***	-.10	.03	.21
16	-.01	**-80***	**.44***	-.01	**.71***	.03	.10	.28	**.83***	-.02	.02	.05	.14	**.90***	-.01	.04	.05	**.85***	.04	.22
17	**.84***	.14	**.80***	.02	.36*	.01	-.10	**.89***	-.03	.02	.00	-.13	**.82***	-.01	.02	-.01	-.08	-.05	**.45***	**.58***
18	-.25*	**-.94***	.15	.20*	**.79***	-.14	-.01	.06	**.86***	-.05	-.22	-.12	.03	**.92***	-.03	-.22	-.12	**.94***	-10	.04
19	**.48***	-.26*	**.50***	-.19*	.03	-.16*	.03	**.50***	.23*	.11	.17	-.31*	.30*	.20	.09	.20	-.27	.10	-.04	**.43***
20	**.60***	.28*	**.57***	.14	-.35*	.11	.06	**.56***	-.21*	.01	.20	.03	**.47***	-.22*	.05	.12	.04	-.15	**.71***	-.04
21	-.21*	**.60***	.01	**.74***	-.02	**.68***	.14*	-.17	-.18*	-.02	.04	**.79***	-.03	-.07	-.02	.02	**.76***	-.03	-.10	-.01
22	**.89***	.08	**.84***	-.04	-.36*	-.04	-.03	**.89***	-.01	-.11	.01	-.09	**.83***	.05	-.11	-.02	-.03	.03	**.52***	**.54***
23	-.15*	**.40***	.14*	**.68***	.16	**.61***	.07	-.02	.08	.06	-.02	**.66***	.07	.19*	.06	.00	**.64***	.16	-.04	.09
24	**.52***	-.29*	**.51***	-.26*	-.01	-.23*	.03	**.52***	.21*	-.01	.06	-.31*	**.40***	.21*	-.02	.12	.12	.08	-.11	**.62***

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. T-ERC = Teacher version of the Emotion Regulation checklist.

Table 7.

Exploratory Analysis of the T-ERC at age 10 (n = 658)

	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	-.06	**.82***	.34*	-.01	**-.71***	.23*	-.05	**-.64***	.36*	-.29*	.35*	.13	**-.66***	.04	.38*	-.07	.14	**-.66***	-.02	-.21*
2	**.80***	-.07	.04	**.81***	.24*	-.01	**.87***	.01	-.37	**.93***	-.02	.05	-.02	-.02	-.02	**.80***	.04	.26*	-.02	-.02
3	-.28*	**.57***	**.75***	.10	-.17*	**.68***	.03	-.20*	.20	-.02	**.73***	-.04	-.22*	.05	**.77***	-.01	-.01	-.05	-.05	-.23*
4	-.39*	.29*	**.67***	-.03	.10	**.64***	-.07	.02	.05	.02	**.64***	-.14	.03	.00	**.65***	.01	-.17	.07	.04	-.01
5	**-.50***	.23*	**.48***	-.26*	.00	**.51***	-.31*	.07	.22	**-.42***	**.50***	.03	.12*	.01	**.51***	**-.40***	.02	-.01	.08	.07
6	**.75***	-.02	.04	**.76***	.17	.02	**.76***	.09	-.15	**.59***	-.02	.30*	.10	-.01	-.02	**.48***	.28*	.23*	.03	.06
7	**-.42***	**.45***	**.83***	.01	.01	**.78***	-.04	-.07	.12	-.04	**.78***	-.08	-.03	-.02	**.78***	-.03	-.10	.01	.02	.00
8	**.80***	-.01	-.16*	**.71***	.02	-.07*	**.71***	.03	-.05	**.70***	-.02	-.01	-.24*	**.47***	-.03	**.72***	-.02	-.02	.35*	-.33*
9	**-.49***	.03	**.50***	-.19	.28*	**.49***	-.20*	.13	-.11	-.06	**.42***	-.17	.24*	-.14	**.43***	-.06	-.23*	.15*	.02	.20*
10	**.58***	-.04	-.20*	**.47***	.00	-.10	**.42***	.26*	.28*	.16	.02	.25*	.02	**.51***	.01	.18	.24	.03	**.45***	-.21
11	**-.46***	.06	**.56***	-.11	.28*	**.52***	-.10	.05	-.22	-.02	**.40***	-.07	.28*	-.32*	**.42***	-.01	-.16	.11	-.04	**.41***
12	**.69***	.01	.07	**.74***	.14	.09	**.72***	.15*	-.02	**.40***	.02	**.46***	.19*	-.05	.03	.26*	**.46***	.34*	-.07	.03
13	**.86***	.38*	-.01	**.80***	-.32*	.04	**.72***	.00	**.41***	.23	.08	**.74***	-.06	.23*	.08	.08	**.72***	-.15	.31	.02
14	**.85***	-.04	-.03	**.81***	.16	-.04	**.80***	.13	-.09	**.61***	.00	.25*	.05	.20*	.00	**.66***	.18	.00	**.40***	.21
15	-.01	**.61***	**.64***	.29*	-.29*	**.54***	.28*	**-.45***	-.01	.08	**.46***	.22*	-.26*	-.34*	**.50***	.06	.26*	-.06	**-.41***	-.02
16	.18*	**-.69***	-.02	.32*	**.74***	.12	.30*	**.77***	-.10	.32*	.05	.05	**.67***	.21*	.06	.00	.10	**.93***	.05	-.14
17	**.81***	.34*	-.01	**.75***	-.27*	.01	**.71***	-.08	.25	.15	-.01	**.62***	-.09	.04	.01	.12	**.63***	.04	-.03	-.13
18	-.04	**-.84***	-.18*	.02	**.79***	.01	-.02	**.92***	.00	-.01	-.05	.03	**.82***	.29*	-.10	-.24*	.02	**.77***	.25*	.04
19	**.67***	-.13	-.21*	**.57***	.10	-.14	**.54***	.27*	.11	.22*	-.15*	**.41***	.20*	.15	-.16*	.13	**.41***	.25*	.14	-.03
20	**.60***	**.47***	.03	**.54***	**-.44***	.01	**.50***	-.26*	.26*	-.12	-.01	**.67***	-.18*	-.07	-.02	-.02	**.69***	**-.42***	.13	.28*
21	-.33*	**.45***	**.52***	-.09	-.-.22*	.38*	-.06	**-.46***	-.16	-.02	.32*	-.04	-.23*	**-.43***	.34*	-.03	.00	-.08	**-.51***	.05
22	**.93***	.36*	-.08	**.83***	-.34*	-.05	**.76***	-.06	-36*	-.04	-.11	**.91***	.00	-.03	-.08	-.14	**.99***	.08	-.10	-.04
23	-.29*	.34*	**.60***	.03	-.01	**.48***	.05	-.28	-.21	.01	.37*	.07	.01	**-.46***	.39*	.01	.02	-.07	-.27	.35*
24	**.71***	.01	-.20*	**.59***	-.04	-.16*	**.58***	.09	.09	.23*	-.16	**.43***	.06	.10	-.16*	.20	**.42***	.09	.10	-.01

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. T-ERC = Teacher version of the Emotion Regulation checklist.

Table 8.

Exploratory Analysis of the P-ERC at age 12 (n = 653)

	T-ERC at T5 (*n* = 627)																	
	2 factors		3 factors			4 factors				5 factors					6 factors					
Item	1	2	1	2	3	1	2	3	4	1	2	3	4	5	1	2	3	4	5	6
1	-.03	**.73***	-.04	.39*	**-.53***	.39*	.01	**-.53***	.0	-.21	.31*	**-.48***	.23*	-.06	-.24*	.28*	**-.49***	.25*	-.01	-.01
2	**.79***	-.08	**.92***	.13	.26*	-.04	**.68***	.22*	**.41***	**.88***	.02	.14	.01	.07	**.96***	.05	.22*	-.01	.07	-.17
3	-.27*	**.65***	.08	**.80***	-.17	**.77***	.04	-.15*	.10	.02	**.69***	-.19	.02	-.09	.02	**.63***	-.02*	.06	-.08	-.23*
4	**-.45***	.29*	-.19*	**.50***	.02	**.56***	-.13	.06	-.10	-.13	**.55***	-.01	-.11	.06	-.13	**.50***	-.06	-.19*	.08	-.02
5	**-.51***	.31*	-.34*	**.42***	-.08	**.59***	-.13	-.03	-.31*	**-.45***	**.55***	.01	.09	.10	**-.45***	**.53***	-.01	.03	.11	.00
6	**.74***	.00	**.80***	.06	.12	-.12	**.57***	.07	.39*	**.73***	-.08	.02	.07	.01	**.74***	-.12	-.02	.04	-.01	.01
7	**-.42***	**.55***	-.05	**.78***	-.05	**.84***	-.00	-.01	-.03	-.05	**.80***	-.08	-.04	.03	-.04	**.79***	.00	-.01	.05	-.24*
8	**.83***	-.01	**.77***	-.12	.02	-.11	**.76***	.02	.09	**.58***	-.01	-.02	.19	.38*	**.61***	-.07	-.03	.04	.34*	.14
9	**-.50***	.13*	-.02	**.71***	.38*	**.75***	-.04	**.44***	.01	-.01	**.69***	.39*	-.09	-.12	.01	**.58***	.06	-.31*	-.14	.26*
10	**.69***	-.21*	**.37***	**-.44***	-.04	-.17	**.66***	.00	**-.41***	.08	-.05	.06	.30	**.63***	.12	.03	.32	.25*	**.60***	.01
11	**-.53***	.17*	-.09	**.66***	.29*	**.72***	-.08	.34*	-.04	-.05	**.68***	.28	-.12	-.05	-.04	**.58***	.02	-.30*	-.05	.19*
12	**.66***	.03	**.65***	-.03	.00	-.10	**.56***	-.02	.20*	.34*	-.16	.11	.36*	-.11	.37*	-.14	.07	.38*	-.12	.01
13	**.93***	.30*	**.81***	-.04	-.27*	.04	**.88***	-.24*	.03	-34*	.02	-.11	**.56***	.21	.38*	.02	-.11	**.47***	.22*	.09
14	**.87***	-.05	**.75***	-.22*	-.01	-.14	**.80***	.01	.02	**.53***	-.06	.00	.24	.38*	**.57***	-.10	-.02	.08	.38*	.17
15	.01	**.61***	.29*	**.67***	-.19*	**.49***	.08	-.19*	.38*	.29*	**.42***	-.24*	.00	-.26*	.28*	.33*	**-.43***	-.05	-.21*	-.04
16	.05	**-.77***	.36*	-.02	**.81***	.01	.30*	**.82***	.04	.30	-.01	**.84***	.00	-.08	.36*	.04	**.84***	.02	-.20	.01
17	**.88***	.36*	**.76***	-.01	-.33*	.01	**.78***	-.31*	.08	.21	-.11	-.08	**.65***	-.06	.28*	-.01	-.02	**.67***	-.01	-.09
18	-.18*	**-.92***	.01	-.26*	**.76***	-.06	.15	**.81**	-.29*	-.13	-.06	**.89***	.07	.10	-.07	-.01	**.85***	.00	.01	.17
19	**.54***	-.19*	**.64***	.00	.27*	.09	**.67***	.31	-.01	.29	.07	**.42***	.36*	.11	.37*	.00	.07	.04	.07	**.54***
20	**.62***	**.44***	**.52***	.08	-.39*	.19*	**.66***	-.36*	-.09	.00	.12	-.18*	**.62***	.13	.00	.08	-.32*	**.50***	.15	.25*
21	-.24*	**.55***	.04	**.67***	-.15	**.48***	-.19	-.14	**.40***	.01	.28	-.10	.10	**-.66***	.00	.20	**-.46***	.07	**-.61***	.06
22	**.87***	.24*	**.68***	-.16*	-.32*	-.06	**.81**	-.29*	-.08	-.07	-.21	.05	**.87***	-.04	-.02	-.08	.11	**.90***	-.02	.03
23	-.20*	.37*	.12	**.60***	.02	**.55***	.03	.04	.15*	.04	**.46***	.04	.06	-.21*	.05	.39*	-.16	-.03	-.19*	.06
24	**.68***	-.01	**.66***	-.06	.04	.07	**.76***	.08	-.06	.09	-.01	.34*	**.65***	.03	.13	-.05	.05	**.45***	.00	**.44***

Note. The columns indicate the factor number of the respective solutions. Only loadings >.40 are reported. All loadings are significant, $p < .05$. T-ERC = Teacher version of the Emotion Regulation checklist.

Appendix G

Table 1.

EFA of the P-ERC at age 8, 10 and 12: Alternatives to Shields and Cicchetti's model

Age	2 factors				3 factors					4 factors					
(years)	1	2	CL	LL	1	2	3	CL	LL	1	2	3	4	CL	LL
8	ERP (6/6) LNR (3/4)	LNP (9/11) ERR (16) 12		4, 10, 20	LNP (6/11) ERR (2/2) ERP (-1, 23)	ERP (3/6) LNR (9, 11) LNP (-17, -22)	ERP (4/6) LNP (17, 20 , 22)	23 on F1/F2; 1 on F1/F3; 7, 17, 22 on F2/F3	4, 5, 10, 24	ERP (5/6) LNR (3/4)	LNP (5/11)	ERR (2/2) LNP (17, 22,24) 12	ERP (-1) LNR (11) ERR (2/2)	11 on F1/F4 18 on F3/F4	
10	ERP (6/6) LNR (4/4) ERR (-18) LNP (-19)	LNP (9/11) ERR (16) 12		20	ERP (6/6) LNR (4/4)	LNP (9/11) ERP (-1) ERR (2/2) 12	LNP (13, 17, 22) LNR (-9)	1 on F1/F2; 9 on F1/F3; 13, 22 on F2/F3		ERP (5/6) LNR (4/4)	LNP (2, 6, 8, 10, 14)	LNP (13, 17, 20, 22) 12	LNR (9, 11) ERR (2/2)	9, 11 on F1/F4	24
12	ERP (6/6) LNR (4/4) ERR (-16, -18)	LNP (8/11) 12		10, 19, 20	ERP (6/6) LNR (4/4) ERR (-18)	LNP (8/11) 12	ERR (2/2) ERP (-1) LNP (-22)	1, 18 on F1/F3; 22 on F2/F3	10, 19, 20	ERP (5/6) LNR (4/4) LNP (-10)	LNP (2, 6, 8, 14)	LNP (13, 17, 20, 22) 12	ERR (2/2) ERP (-1)		19, 20

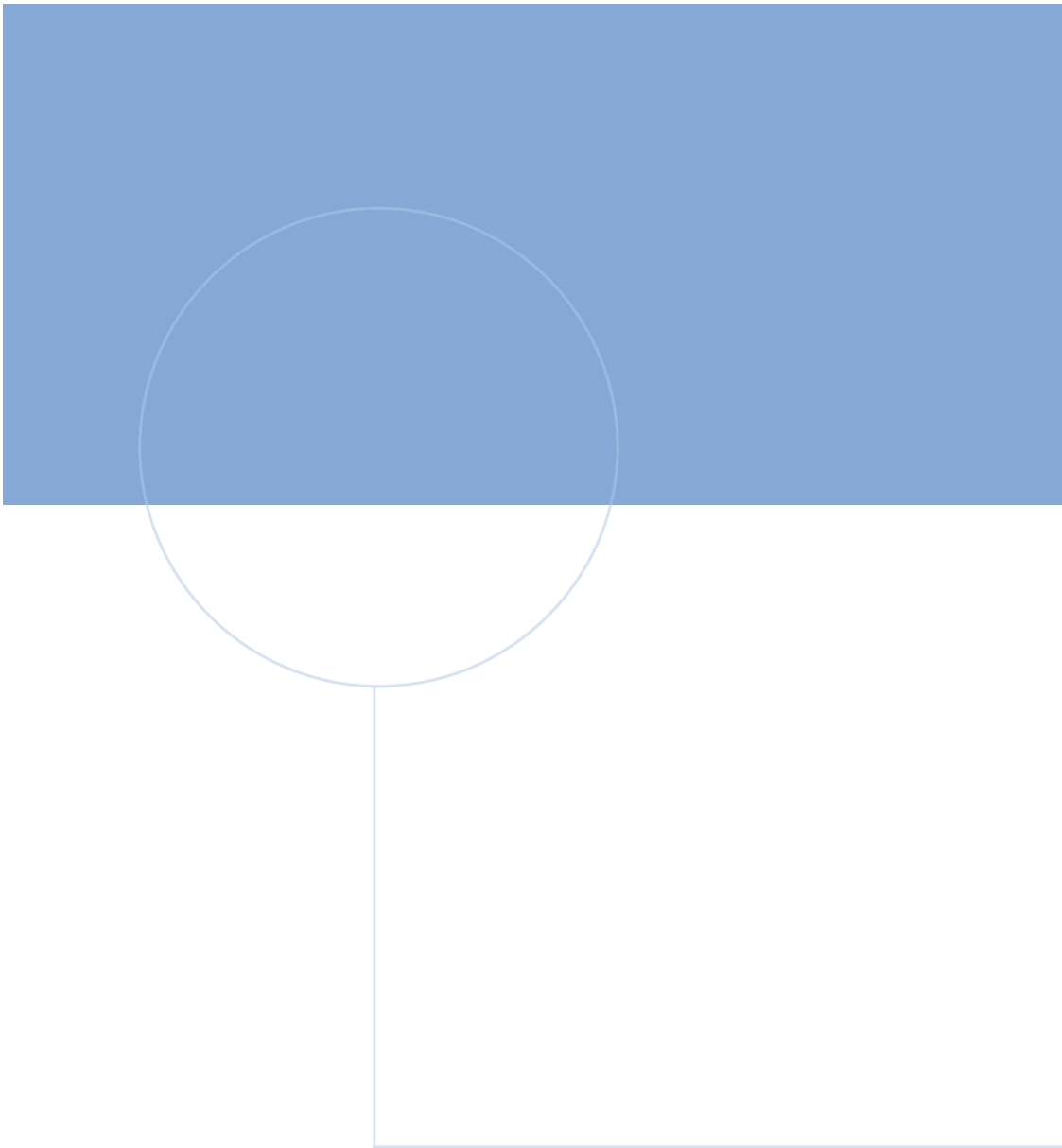
Note. The columns indicate the numbers of factors extracted; the rows indicate timepoint of data collection; negative loading on a factor is indicated by (-); CL = Cross-Loadings; LL = low loading items; ERP = positively scored items from the ER-subscale; ERR = reverse scored items from the ER-Subscale; LNP = positively scored items from the L/N subscale; LNR = reversed scored items from the L/N subscale; F = factor

Table 2.

EFA of the T-ERC at age 6-12: Alternatives to Shields and Cicchetti's model

Age	2 factors				3 factors					4 factors					
(years)	1	2	CL	LL	1	2	3	CL	LL	1	2	3	4	CL	LL
8	LNP (10/11) LNR (-5) 12	ERP (6/6) LNR (5) ERR (-16, -18)	5 on F1/F2	4, 9, 11	LNP (10/11) ERR (16) 12	ERP (6/6) LNR (4/4) LNP (-10)	ERR (2/2) ERP (-1)	16 on F1/F3; 1 on F2/F3		ERP (5/6) LNR (3/4)	ERP (2, 6, 14) LNR (-4, -5)	LNP (11/11) 12	ERR (2/2) ERP (-1)	4 on F1/F2: 2, 8, 14 on F2/F3	
10	LNP (11/11) LNR (-4, -9, -11) ERP (-7) 12	ERP (4/6) ERR (-16, -18)	7 on F1/F2	4, 23	ERP (5/6) LNR (4/4)	LNP (11/11) 12	ERR (2/2) ERP (-1) LNP (-20)	20 on F2/F3		Undetermined solution					
12	LNP (11/11) LNR (-4. 5, -9, -11) ERP (-7) 12	ERP (5/6) ERR (-16, -18) 20	7, 20 on F1/F2	23	LNP (10/11) 12	ERP (5/6) LNR (4/4) LNP (-10)	ERR (2/2) ERP (-1)			ERP (5/) LNR (4/4)	LNP (11/11) 12	ERR (2/2) ERP (-1) LNR (9)	LNP (2, 10) ERP (21)	21 on F1/F4 2, 10 on F2/F4	

Note. The columns indicate the numbers of factors extracted; the rows indicate timepoint of data collection; negative loading on a factor is indicated by (-); CL = Cross-Loadings; LL = low loading items; ERP = positively scored items from the ER-subscale; ERR = reverse scored items from the ER-Subscale; LNP = positively scored items from the L/N subscale; LNR = reversed scored items from the L/N subscale; F= factor



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