Original Article

Validating the Short Version of the Multidimensional Emotional Competence Questionnaire

Sebastian Gerbeth and Elena Stamouli

Faculty of Human Sciences, University of Regensburg, Germany

Abstract: The short version of the Multidimensional Emotional Competence Questionnaire (MECQ-s) is a competence-based questionnaire with a multidimensional framework assessing emotional competence. It consists of 32 items divided into 11 factors representing four dimensions: perception of one's own emotions, perception others' emotions, emotional expressivity, and emotional management. Three studies (N_{total} = 1,333) were conducted to validate the MECQ-s. Overall, reliability estimates were good (α = .72–.80 and ω = .71–.79). The results of confirmatory factor analysis (CFA) and exploratory structural equation modelling (ESEM) corroborated the multidimensional structure of the MECQ-s and proved to be satisfactory. Correlations of the MECQ-s with scales of experiencing emotions provide evidence for convergent validity. A nomological network of measures including the Big Five personality, self-regulation, and self-efficacy indicates that the MECQ-s proved good nomological and discriminant validity. The results for measurement invariance and test–retest reliability were satisfactory. The MECQ-s proved to have satisfactory psychometrics and can be used to evaluate emotional competence.

Keywords: emotional competence, validity, test–retest reliability, exploratory structural equation modelling, measurement invariance

Since the beginning of this century, increased attention has been paid investigating emotional intelligence, which describes the ability to identify, express, understand, manage, and use emotions (Mayer & Salovey, 1997). Considering emotions as feeling states with experiential, physiological, cognitive, expressive, and motivational components, it becomes evident that individuals react differently when they experience emotions (Scherer, 2005; Siemer et al., 2007). To capture interindividual differences during interactions, there is a demand to consider emotional intelligence or rather emotional competence (EC) as a multidimensional construct integrating different theoretical approaches of emotional intelligence and EC (Gerbeth et al., 2021; Mestre et al., 2016). EC is defined as a set of competences for dealing with own and others' emotions during interactions, thus helping the individual process emotional information and behave in an adaptive manner (Stamouli, 2014). We prefer the term *competence* instead of *intelligence* because competences can be learned, developed, and enhanced over time. Referring to the emotions as social information theory (Van Kleef, 2016) competences such as the perception of own emotions and others' emotions, the expressivity and the regulation of emotions are essential for the interaction process. These competences are included in the 32 items of the short version of the Multidimensional Emotional Competence Questionnaire (MECQ-s) representing four dimensions (perception of own emotions, perception of the emotions of others', the expressivity of emotions, and emotional management) and 11 factors: attention to own emotions, clarity of perception of emotions, empathic concern, phantasy, perspective-taking, trust in one's own expressivity, expressivity of negative as well as positive emotions, the influencing of one's own emotions, and the reflexive handling of emotions.

Although existing research approaches use unidimensional conceptualizations of emotional intelligence, only moderate intercorrelations between the individual competences were found (Fiori & Antonakis, 2011; Rossen et al., 2008). Our aim is to take into account these moderate relationships between the individual competences and to propose a multidimensional conceptualization of EC by examining the validity of the MECQ-s. In proposing a multidimensional construct which integrates numerous facets of emotional competences, three of these benefits stand out for the research. First, considering a set of competences might account for applying the MECQ-s as a validated instrument to capture individual differences in multiple emotional competences. Second, it enables the identification of single emotional competences in social contexts (e.g., at work or in education) when specific demands and workloads arise. Finally, the multidimensional

conceptualization of emotional competence might be advantageous for both research and practice, since it can provide the basis for necessary trainings focusing on every single competence and on the whole construct to foster EC of individuals.

Theoretical Background

Emotional aspects in organizational settings are studied in numerous contexts, and there is evidence that EC is related to organizational outcomes such as job satisfaction, well-being (Miao et al., 2017; Sánchez-Álvarez et al., 2016), health, burnout (Fiorilli et al., 2019; Martins et al., 2010), job performance (Joseph et al., 2015; O'Boyle et al., 2011), and organizational commitment (Stamouli & Gerbeth, 2021). In addition, EC received interest in the educational context (Petrides et al., 2004). Research shows relations with self-efficacy, motivation, and personality as well as academic outcomes such as academic performance (Sánchez-Álvarez et al., 2020), academic achievement (MacCann et al., 2020), and coping strategies (Thomas et al., 2017). Furthermore, there is evidence (from a high school student sample) to suggest that EC and decision-making are related (Di Fabio & Kenny, 2012).

Comparing the conceptualization of emotional intelligence to the conceptualization of emotional competence, it is obvious that both are based on ongoing discrepancies between the conceptional framework and the usage of the term intelligence (Asendorpf, 2018). In recent research, there are three different branches of EC and EI research: the ability approach based on the research of Mayer and Salovey (1997), the trait approach capturing typical behavior in emotional situations (Petrides & Furnham, 2003), and the mixed approach combining various emotional and social abilities, skills, and competences (O'Connor et al., 2019). The main differences between the three approaches are mainly due to the different measurement instruments and their application. Measurement instruments of the ability approach are oriented along intelligence tests and try to capture emotional abilities via maximum performance. A frequently used instrument in the ability approach is the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT; Mayer et al., 2003). With 141 items and 30–40 min of processing time, the test is comparatively time-consuming and is based on a consensus rating system for which a *correct* answer only reflects the tendency of the majority of respondents (Maul, 2012). The trait approach instruments such as the Assessing Emotions Scale (Schutte et al., 2009) use mainly respondent self-reports and are mostly based on a unidimensional conception of EC similar to the ability approach. Mixed approach measurement instruments combine various social and emotional skills, abilities, and competences (for example, with self-efficacy or personality traits) with the aim of providing a comprehensive assessment tool for organizations and counselling such as the Emotional Quotient Inventory (EQ-I; Bar-On, 2004). Due to the unidimensionality and the fact that many measurement instruments work with a global EC score, the results of the single dimensions or competences are not reported in many publications, and thus, the differences regarding the connection to other constructs are hardly examined. This problem concerns different measurement approaches that consequently produce different results even if the constructs are operationalized by similar dimensions. Our multidimensional measurement approach highlights the contribution of every single competence (or dimension) being crucial to understand and interpret one's EC. The distinction that we suggest between unidimensional and multidimensional measurements of EC has important theoretical implications.

The Multidimensional Emotional Competence Questionnaire (MECQ; Stamouli et al., 2006) addresses the multidimensionality of EC by including 13 competences of difference theoretical conceptualization such as perceiving own emotions (Salovey et al., 1997), perceiving others' emotions (Davis, 1983), expressing emotions (Gross & John, 1998; Roger & Nesshoever, 1987), regulating emotions (Gross & John, 1998; Roger & Nesshoever, 1987; Salovey et al., 1997), and masking emotions (Gross & John, 1998; Roger & Nesshoever, 1987). The MECQ in its original version has 109 items with 13 factors. In our aim to optimize criteria of usability and economy (due to the long completion time of the MECQ), we developed a short-version MECQ-s (Gerbeth et al., 2021). Using an item selection strategy based on test and item statistics as well as item content, we were able to reduce the number of items while capturing the multidimensionality of EC and maintaining content comparability with the original longer version MECQ. In this term, two factors of the original version of the MECQ were removed due to the low quality of their items. The MECQ-s assesses 11 factors and four dimensions of EC with 32 items on a five-point Likert-type scale (1 = *does not apply* to 5 = *fully applies*) and has a completion time of 10–15 min. The identified factors of EC include the attention to own emotions and the clarity of perception of emotions (theoretical dimension of the perception of one's own emotions); empathic concern, phantasy, and perspective-taking (theoretical dimension of the perception of emotions of others); the positive (joy and fun) and negative expressivity of emotions and the trust in one's own expressivity (theoretical dimension of emotional expressivity); the reflexive handling of emotions and the influencing of one's own emotions (theoretical dimension of emotional management). The MECQ-s is reliable with Cronbach αs for dimensions ranging from $\alpha = .75$ to $\alpha = .76$ and for the factors ranging from $\alpha = .69$ to $\alpha = .84$. Based on the MECQ, the MECQ-s showed a similar factor structure with 11

factors in the exploratory factor analysis (EFA). In addition to the 11-factor structure, a four-factor structure was also found. An initial CFA confirmed the two structures and a combination of these in a model with 11 first-order factors and four second-order factors that showed an acceptable model fit (CFI = .900/.911, RMSEA = .048/.043, SRMR = .086/.067) in two samples.

The aim of the present research is to validate the MECQ-s as the short, multidimensional measurement instrument for EC and to extend the findings of the development study (Gerbeth et al., 2021) in an independent validation study. Therefore, we are continuing our approach to examine the psychometric properties of the MECQ-s by testing reliability and validity based on the recommendations by Smith et al. (2000). For *construct validity*, we expect to replicate the factorial structure with 11 factors and four dimensions. Furthermore, we expect a higher-order model combining the two structures to fit the data satisfactorily. For *convergent validity*, we expect that the factor structure of the MECQ-s is invariant with respect to the measurement as a long version or a short version, gender, and age. Furthermore, we expect the MECQ-s to have high convergent correlations with the long-version MECQ and a related self-assessment scale that assesses tendencies in experiencing emotions. We expect correlations with the personality traits and self-efficacy for satisfactory *nomological validity*. With regard to the student sample, we assume that EC is related to decision-making and to behavior in self-regulated learning. In addition, we expect good reliability of the measurement instrument also in terms of *test–retest reliability*.

Method

Overview of the Studies

Data were collected at the university using an online questionnaire, and students majoring in teacher education were considered. Student participation was voluntary, and informed consent was given by all participants. For this validation study, ethical clearance was obtained from the University of Regensburg Ethics Committee prior to data collection. Data from three samples were used for the present validation. Data of Sample 1 were analyzed to address the construct validity, as well as convergent, nomological, and discriminant validity (Study 1). Therefore, we aimed to have 300–500 participants for our analyses due to the recommendations of Koran (2020) and Chen (2007). Regarding test–retest reliability (Study 2), the data in Sample 2 were collected at two measurement points, two weeks apart. Study 2 was announced one week in advance, and all details of the study were sent to the participants. Data of Sample 3 were combined with data of Sample 1 to test for measurement invariance (Study 3) with respect to the measurement as a long version or a short version, gender, and age.

Samples

Sample 1

For the analysis of validity, data were collected in four waves from a total of 538 university students at a German university. Data of 20 respondents had to be removed due to a high amount of missing data, leading to data from 518 respondents being used for the analysis: 74.3% of the respondents were female, while 21.4% were male and two respondents classified as gender diverse. Twenty respondents refused to report any demographic data. The students were aged between 18 and 44 years [M (SD) = 21.38 (3.01)]. Of the participants, 33.8% studied to be teachers for primary schools, 18.8% for secondary schools, 40.5% for gymnasium, and 16 studied for a bachelor's or master's degree of education. After completion of the survey, 195 participants agreed to directly fill out the long-version MECQ for a comparison with the short version of the measurement instrument.

Sample 2

For the analysis of test–retest reliability, data were collected from 39 university students with 69.2% of the participants being female and an average age of M = 21.33 (SD = 1.72; students were aged between 19 and 29 years). The students studied teacher education at a German university. Data of one respondent had to be removed due to cancellation of participation, resulting in 38 respondents used for the analysis.

Sample 3

For measurement invariance, Sample 3 was used with the data of 777 participants who completed the long version of the questionnaire (MECQ); 70.4% of the participants were female, and the average age was M = 27.07 (SD = .46). The data of Sample 3 were collected through printed and online advertising for anonymous and voluntary participation at a German university. Together with Sample 1, Sample 3 enabled a cross-comparison for measurement invariance according to samples who either filled out the short version or the long version of the measurement instrument. Furthermore, through the combination of Samples 1 and 3, we could address measurement invariance for gender and age (the combination of the samples was necessary for statistical power as there was low participation of males in the first study).

Measures

EC was assessed with the MECQ-s (Samples 1 and 2) and the long-version MECQ (Samples 1 and 3). The MECQ-s is a 32-item short version measuring four dimensions of EC within a total of 11 factors. Attention to own emotions and clarity of emotional perception assess the competences to draw attention to emotional situations and to recognize own emotional states and distinguish between different emotions (three items per factor, e.g., "I almost always know exactly how I am feeling"). Empathic concern, phantasy, and perspective-taking assess the competences to perceive the emotions of others or fictitious characters, empathize with them, and understand them (three items each for empathy and phantasy, four items for perspective-taking, e.g., "I sometimes try to understand my friends better by imagining how things look from their perspective"). Trust in one's own expressivity and positive and negative expressivity assess the competence to express emotions and the confidence of individuals expressing themselves (two items for trust in one's own expressivity, five for positive expressivity – fun and joy, three items for negative expressivity, e.g., "What I am feeling is written all over my face"). Reflexive handling of emotions and influencing one's own emotions assess the competences to influence emotions and adapt them to a given situation and process emotions reflexively [three items per factor, e.g., "I find it hard to get thoughts about things that have upset me out of mind (reversed)"]. The MECQ consists of 13 different factors of EC with 109 items. The factors already mentioned in the MECQ-s were also assessed in the MECQ, however with more items in each factor. Additionally, the factors of masking emotions and aggression control were measured, which, on the one hand, assess the competence to hide one's own emotions and exhibit emotions adapted to the situation (six items, e.g., "In different situations and with different people, I often act like very different people") and, on the other hand, assess the competence to control the emotion of anger [six items, e.g., "If someone pushed me, I would push back (reversed)"]. Both questionnaires use a 5-point Likert-type scale (ranging from 1 = *does not apply* to 5 = *fully applies*). Next to the MECQ-s and MECQ, several instruments were implemented to obtain convergent, nomological, and discriminant validity. These instruments included the following: scales of experiencing emotions (SEE), Big Five personality, self-efficacy, proactive decision-making, action regulation problems; time management, initial control and positive self-motivation (for details on the instruments, see Section 1 in Supplementary Material 1).

Analyses

Study 1

For construct validity, analyses of the items' psychometric properties and correlation analysis were carried out using SPSS 25 (IBM Inc.). With regard to reliability, McDonald's omega (ω), which provides stable estimates for reliability within multidimensional constructs (Zinbarg et al., 2005) using RStudio, was included as well as Cronbach α.

To replicate the findings concerning the factor structure, an EFA was carried out to investigate factorial validity in a first step. To validate the short version in terms of construct validity, confirmatory factor analysis (CFA) and exploratory structural equation modelling (ESEM) were carried out in Mplus v.8.2.

Based on the EFA and findings of the development study by Gerbeth et al. (2021), an 11-factor model as well as a four-factor model and a combined second-order model were examined. Model 1 represents the 11 factors of the EFA of the original version by assigning the items to their content factors. Model 2 is based on the four content dimensions found (perception of own emotions, perception of others' emotions, emotional expressivity, and emotional management) and summarizes items of associated factors in the four dimensions. As items from the same original factor correlate more strongly with each other than with items from the same dimension, this common specific variance of two items is referred to as correlated uniqueness (CU) and is included in Model 3 (Model 2 with CU). Although the use of CU should generally be avoided, in this case, we follow the proposals of Marsh et al. (2010), who argue for the use of CU in factor analysis in multidimensional models whose items are based on different facets. We calculated CFA and ESEM without and with CU. Model 4 proposes four correlated second-order factors corresponding to the four content dimensions of EC and including the 11 first-order factors of Model 1. Hair et al. (2014) suggest model fit indices RMSEA < .08 and SRMR < .10 as well as CFI > .90 for acceptable model fit and RMSEA < .06, SRMR < .08 and CFI > .95 for good fitting data. A recent Monte Carlo simulation study by Koran (2020) simulated CFAs with different number of factors, factor loadings, and indicators per factor. This study showed that for 12 factors with .60 factor loadings and 3 indicators per factor, the minimum required sample size would be $N = 250$. Therefore, we considered our total sample to be large enough for the planned analyses. Figures of all models are presented in Supplementary Material 2 and the syntax for the analysis in Supplementary Material 3.

To assess convergent validity, we compared the MECQ-s with SEE. Based on the content relationships of the two instruments, we expected positive correlations

between them. For nomological validity, we tested the relationships between the factors and dimensions of the MECQ-s and various constructs, such as personality, self-efficacy, and positive self-motivation, which are thought to be related to EC. We additionally tested whether there are correlations with constructs, such as time management, with which emotional competence should not be related. Following, the recommendations of Gignac and Szodorai (2016), correlations r = .10 are considered as small, r = .20 as medium, and r = .30 as large effect sizes. For correlation analysis, we used G*Power (Faul et al., 2009) to evaluate post hoc power analysis. A power of > .80 was achieved for correlations above r = .20 (N = 195) and for correlations above r = .15 with a sample greater than N = 350.

Study 2

For test–retest reliability, correlations and intraclass correlation coefficient (ICC) were carried out using RStudio. A two-way mixed-effects model with absolute agreement was conducted, and test statistics were set at 95% confidence intervals (CI). According to Fleiss et al. (2003), values above .75 can be considered as excellent, values from .40 to .60 as acceptable, values from .60 to .75 as good, and values smaller than .40 as inacceptable. For retest analysis, we used G*Power (Faul et al., 2009) to evaluate post hoc power analysis showing power > .90 for the correlations.

Study 3

For construct validity, we compared the MECQ-s by testing for measurement invariance across gender, age, and across subsamples, who filled out either the long or short version of the questionnaire. Measurement invariance analysis was carried out using Mplus v.8.2. Following the recommendations by Chen (2007), noninvariance would be indicated by a change of ≥ .010 in CFI, supplemented by a change of ≥ .015 in RMSEA or a change of ≥ .030 (≥ .010 for scalar measurement invariance) in SRMR. The syntax of the analysis is available in Supplementary Material 3.

Results

Study 1

Item Analysis and Reliability

Item statistics (means, *SD*s, item-scale correlations) for the 32 items of the MECQ-s and for the same 32 items in the MECQ can be found in Section 2 in Supplementary Material 1. The corrected item-total correlations ranged between .39 and .71 for the short version (Mr_{it} = .59) and between .51 and .79 for the same items in the long version (Mr_{it} = .66). Regarding the dimensions of EC, the corrected item-dimension correlation ranged between .24 and .64 (short version; Mr_{it} = .45) and between .26 and .71 (long version; Mr_{it} = .50). Furthermore, correlations of the items of the short version with the items of the long version ranged between .43 and .89 with an average of Mr = .66. Descriptive statistics, intercorrelations, and Cronbach α as well as McDonald's ω are presented in Section 3 in Supplementary Material 1. Cronbach α ranged between .66 and .83 with an average of Mα = .75, while McDonald's ω ranged between .64 and .83 with an average of Mω = .75. The intercorrelations show positive and negative correlations between the factors and dimensions as well as nonsignificant correlations that support the multidimensionality of the construct (Section 3 in Supplementary Material 1).

Construct Validity

In the first step, we carried out an EFA to check for factorial validity. The EFA pointed to a four-factor solution (scree plot, Velicer's MAP test) and an 11-factor solution (scree plot, parallel analysis). In Section 4 in Supplementary Material 1, the factor loadings of the two structures are presented. While the 11-factor solution replicates the structure of the development study clearly, the four-factor solution contains cross-loadings of individual items on other factors than expected. Nevertheless, the factor structure of the development study could be replicated.

Table 1 shows the model fits of the four measurement models for the MECQ-s in CFA and ESEM. Model 1 with 11 primary factors showed in CFA and ESEM had the best model fit. Model 1 reaches better model fit for the ESEM model (ΔCFI = +.05, ΔTLI = +.04, ΔRMSEA = −.011, ΔSRMR = −.033) compared to the CFA model. The factor loadings of the CFA for all items ranged between λ = .46 and .85 with an average of Mλ = .72. For the ESEM, the same "main" loadings range from λ = .46 to .96 with an average of Mλ = .71. Model 2 with four primary factors did not reach an acceptable model fit for CFA and for ESEM. Model 3 consists of a priori CU based on the original factors of the MECQ, in which items of the same factors can correlate with each other. For CFA, the model fits of Model 3 compared to Model 2 were better with CFI, RMSEA, and SRMR being acceptable (CFI = .90, RMSEA = .047, SRMR = .078). The corresponding ESEM Model 3 fits the data much better than in CFA (ΔCFI = +.07, ΔTLI = +.07, ΔRMSEA = −.017, ΔSRMR = −.047). Furthermore, Section 5 in Supplementary Material 1 presents similar model fits for comparison with Sample 3 with items of the MECQ and four separate dimensional measurement models.

Table 1. Model fits of the CFA and ESEM

Model	χ^2	*df*	CFI	TLI	RMSEA [CI]	SRMR	AIC	BIC	Adjusted BIC
CFA									
Model 1: 11 factors	721.79	409	.94	.92	.038 [.034–.043]	.047	42,844.72	43,486.47	43,007.16
Model 2: 4 factors	2,810.23	458	.52	.48	.100 [.096–.103]	.106	44,973.37	45,406.87	45,083.10
Model 3: 4 factors with CU	941.35	436	.90	.88	.047 [.043–.051]	.078	43,024.23	43,551.23	43,157.63
Model 4: 11 factors – 4 dimensions	953.98	449	.90	.89	.047 [.042–.051]	.074	43,008.64	43,480.39	43,128.05
ESEM									
Model 1: 11 factors	274.81	199	.99	.96	.027 [.019–.035]	.014	42,758.22	44,292.46	43,146.58
Model 2: 4 factors	2015.19	374	.66	.55	.093 [.089–.097]	.064	44,249.19	45,039.69	44,449.29
Model 3: 4 factors with CU	516.79	349	.97	.95	.030 [.025–.036]	.031	42,730.49	43,627.24	42,957.48
Model 4: 11 factors – 4 dimensions	379.94	237	.97	.94	.034 [.028–.040]	.037	42,794.17	44,166.91	43,141.65

Note. N = 518, CFI, TLI > .90, RMSEA < .60, SRMR < .10 for acceptable fit. CFA = confirmatory factor analysis, CI = confidence interval, ESEM = exploratory structural equation modelling, Model 1 = 11 first-order factors based on the original factors, Model 2 = four first-order factors based on the dimensions of EC, Model 3 = Model 2 with implemented correlated uniqueness (CU), Model 4 = 11 first-order factors assigned to four second-order factors based on the dimensions of EC (residual variance of influencing one's own emotions constrained to be greater than a small positive value).

Based on the findings of Models 1–3 and the separate dimensional models, we carried out CFA and ESEM for a hierarchical Model 4 (four secondary factors and 11 primary factors). For CFA, the model fits were acceptable with CFI = .90, TLI = .89, RMSEA = .047, and SRMR = .074 (for Sample 3, we found similar but slightly better model fits with CFI = .91, TLI = .90, RMSEA = .040, and SRMR = .063). The ESEM of Model 4 presents substantially better model fits than the CFA (ΔCFI = +.07, ΔTLI = +.05, ΔRMSEA = −.013, ΔSRMR = −.037). In contrast to Model 3, Model 4 has the better model fit based on the Akaike information criterion and Bayesian information criterion for CFA. We note that in Model 4 with four higher-order correlated factors, one of the residual variances was negative, so we fitted an alternative model in which the residual variances were constrained to be non-negative (see Supplementary Material 1, Section 6 for further discussion). The factor loadings of Model 4 for the CFA and the ESEM are presented in Supplementary Material 1, Section 5, Table 15 and Table 16. The factor loadings of the CFA for all items ranged between λ = .45 and .85 with an average of $M\lambda$ = .72. For the ESEM, the same main loadings range from λ = .46 to .91 with an average of Mλ = .70. For the second-order factors, the loadings of the primary factors ranged from λ = .24 to .99 with an average of Mλ = .59 for CFA and from λ = .29 to .99 with an average of Mλ = .54 for ESEM. The additional loadings in the ESEM were systematically smaller than the main loadings (|λ| ranged from .00 to .25), yet there were significant cross-loadings of individual items, suggesting the multidimensionality of the instrument (e.g., Item 01 positive expressivity on factor trust on own's own expressivity with λ = .25). The correlations of the second-order factors were similar for the CFA and ESEM (PowE with PotE: r_{CFA} = .59, r_{ESEM} = .58; EMG with EXP: r_{CFA} = .55, r_{ESEM} = .38; see Supplementary Material 2).

Brauer et al. (2023) recommended the usage of mean- and variance-adjusted weighted least squares (WLSMV) estimator instead of the robust maximum likelihood (MLR) for estimating the factor loadings in the CFA. Therefore, all models of the MECQ-s in CFA and ESEM were analyzed with both robust maximum likelihood (MLR) estimator and WLSMV estimator. Compared to the MLR estimator, the findings of WLSMV estimation show almost same model fits and factor loadings. In Supplementary Material 1, Section 5 model fits and factor loadings are presented for the analyses with WLSMV estimator.

The better model fits of the ESEM models, as well as the lower factor loadings and factor correlations, support the assumption that EC consists of interrelated dimensions and factors, which should be investigated rather multidimensional than unidimensional because of the only moderate correlations between the factors and dimensions.

Convergent Validity

To address the convergent validity, we compared the MECQ-s with the long-version MECQ and the scales of experiencing emotions (SEE) in a second step. Table 2 presents the correlations and Cronbach's α for the instruments (see Supplementary Material 1, Section 7 for more information).

Regarding the Cronbach α, the strongly reduced short version still achieved good alphas in comparison with the MECQ. Considering factors with many items such as the reflexive handling of emotions (reduced from nine items to 3 items), the Cronbach α drops by just .05, which speaks for the quality of the short scale. Only empathic concern is not absolute satisfactory with Cronbach α of .61 in comparison with the long version (α = .83). Corresponding factors and dimensions of the short and long version of the measurement

Table 2. Convergent validity of the MECQ-s

Scale	*M*	*SD*	α	ae	cp	em	pt	ph	te	pej	pef	ne	in	re	PowE	PotE	EXP	EMG
Experiencing emotions (SEE)																		
Acceptance of own emotions	3.69	.78	.87	.28**	.44**	.06	.12*	.11*	.14**	.18**	.24**	.19**	.37**	.26**	.46**	.14**	.31**	.38**
Experiencing emotional overload	3.17	.95	.89	−.04	−.37**	.22**	−.08	.06	−.06	.10	−.10	.11*	−.40**	−.52**	−.29**	.80	.03	−.57**
Experiencing lack of emotion	2.26	.71	.74	−.25**	−.39**	−.16**	−.07	−.13*	−.09	−.18**	−.15**	−.13*	−.09	.01	−.42**	−.16**	−.22**	−.05
Physical symbolization of emotions	3.24	.73	.82	.21**	.02	.35**	.11*	.21**	.04	.29**	.20**	.26**	.07	−.21**	.13**	.30**	.33**	−.09
Imaginative symbolization of emotions	2.78	.91	.84	.09	−.11*	.22**	.11*	.33**	.07	.39**	.16**	.07	.11*	−.12*	−.03	.29**	.27**	−.01
Experience of emotion regulation	3.12	.72	.68	−.06	.17**	−.05	.30**	.00	.18**	.17**	.13*	−.11*	.51**	.33**	.10	.13*	.12*	.51**
Experience of self−control	3.25	.67	.72	−.10	.12*	−.15**	.25**	.02	−.06	−.02	−.10	−.58**	.27**	.31**	.03	.07	−.36**	.36**
MECQ – long version																		
Attention to own emotions	3.93	.58	.82	**.57****	.31**	.23**	.26**	.31**	−.03	.22**	.11	.18*	.22**	−.08	**.53****	.39**	.22**	.08
Clarity of the perception of emotions	3.53	.68	.89	.22**	**.70****	−.08	.12	.08	.16*	.18*	.08	.17*	.23**	.07	**.64****	.07	.25**	.19**
Empathic concern	3.82	.62	.83	.14	.01	**.73****	.22**	.25**	−.18*	.09	.13	.12	−.04	−.30**	.08	**.58****	.09	−.21**
Perspective taking	3.46	.71	.79	.04	.11	.20**	**.84****	.12	.01	.13	.07	−.06	.34**	−.02	.10	**.61****	.05	.20**
Phantasy	3.65	.84	.87	.08	−.06	.30**	.07	**.79****	.03	.26**	.05	.00	−.04	−.28**	.00	**.54****	.13	−.20**
Trust in one's own expressivity	2.81	.72	.83	−.07	.16*	−.09	.16*	.04	**.66****	.09	.23**	.04	.20**	.12	.09	.06	**.39****	.20**
Positive expressivity joy	3.71	.67	.77	.21**	.18*	.21**	.23**	.26**	.11	**.75****	.26**	.14	.21**	−.09	.25**	.35**	**.52****	.08
Positive expressivity fun	3.87	.69	.79	.10	.14	.15*	.20**	.17*	.24**	.32**	**.76****	.04	.33**	.05	.16*	.26**	**.57****	.24**
Negative expressivity	3.17	.63	.89	.26**	.34**	.14	.00	.00	.05	.09	.18*	**.67****	.10	.03	.39**	.07	**.48****	.08
Masking emotions	3.22	.56	.68	.16*	.41**	−.02	.17*	−.02	−.04	.−.05	.00	.02	.34**	.26**	.40**	.07	−.02	**.37****
Influencing one's own emotions	3.27	.82	.85	.13	.29**	.03	.39**	−.03	.17*	.25**	.25**	−.03	**.81****	.36**	.28**	.21**	.26**	**.72****
Reflexive handling of emotions	2.74	.80	.88	−.01	.16*	−.22**	.17*	−.12	.09	−.02	.10	−.06	.47**	**.75****	.11	−.07	.04	**.74****
Aggression control	2.24	.65	.75	−.09	−.01	−.15*	−.19*	−.05	.34**	−.03	.09	.07	−.08	.14	−.06	−.20**	.19**	.03

Note. Experiencing emotions: $N = 363$, MECQ: $N = 195$; ae = attention to own emotions, cp = clarity of the perception of emotions, em = empathic concern, pt = perspective taking, ph = phantasy, te = trust in one's own expressivity, pej = positive expressivity joy, pef = positive expressivity fun, ne = negative expressivity, in = influencing one's own emotions, re = reflexive handling of emotions, PowE = perception for one's own emotions, PotE = perception of emotions of others, EXP = emotional expressivity, EMG = emotional management. Correlations of variables measuring the same content are presented in bold. *$p < .05$. **$p < .01$.

Table 3. Nomological and discriminant validity of the MECQ-s

Dimension	*M*	*SD*	A	ae	cp	em	pt	ph	te	pej	pef	ne	in	re	PowE	PotE	EXP	EMG
Personality traits																		
Extraversion	3.56	.87	.80	.21**	.15**	.14**	.11*	.10*	.60**	.26**	.49**	.17**	.29**	.09*	.22**	.16**	.57**	.23**
Agreeableness	3.14	.83	.64	.23**	.19**	.32**	.32**	.16**	−.08	.18**	.16**	−.06	.30**	.14**	.26**	.37**	.08	.26**
Conscientiousness	3.56	.83	.78	.08	.16**	.23**	.16**	.06	−.07	.09*	.05	.07	.12**	.00	.16**	.20**	.07	.07
Neuroticism	3.27	.90	.77	−.08	−.33**	.25**	−.14**	.10*	−.19**	−.03	−.21**	.10*	−.57**	−.49**	−.28**	.08	−.11*	−.64**
Openness to experience	4.01	.69	.68	.13**	−.01	.27**	.37**	.31**	.11*	.22**	.08	.01	.11*	−.12**	.06	.45**	.15**	−.01
Self-efficacy	28.61	4.48	.85	.08	.31**	−.11*	.21**	.03	.17**	.11*	.26**	−.01	.56**	.31**	.27**	.09*	.20**	.53**
Proactive decision-making	4.87	.77	.88	.07	.27**	.15**	.33**	.10*	.12*	.20**	.10*	.07	.30**	−.07	.23**	.28**	.18**	.13**
Initiation control	2.91	1.01	.87	−.03	.22**	.08	.11*	−.03	−.01	.05	.04	.02	.15**	.04	.15**	.09	.04	.11*
Positive self-motivation	2.32	.81	.82	.08	.16**	.11*	.21**	.10	−.07	.09	.06	.02	.25**	.05	.16**	.21**	.05	.18**
Time management	2.74	1.06	.85	.08	.05	.09	.04	.09	.04	.11	.14*	.12*	.06	−.01	.08	.10	.17**	.03
Action regulation problems	2.99	.85	.88	−.03	−.28**	−.10	−.11*	.02	.05	−.02	.02	−.05	−.11*	−.09	−.23**	−.10	−.01	−.12*

Note. Different sample size is due to waves in Sample 1 and missing data: self-efficacy (*N* = 515), BFI-K (*N* = 509), decision-making (*N* = 483), initiation control (*N* = 342), positive self-motivation (*N* = 342), time management (*N* = 330), action regulation problems (*N* = 328), ae = attention to own emotions, cp = clarity of the perception of emotions, em = empathic concern, pt = perspective taking, ph = phantasy, te = trust in one's own expressivity, pej = positive expressivity joy, pef = positive expressivity fun, ne = negative expressivity, in = influencing one's own emotions, re = reflexive handling of emotions, PowE = perception for one's own emotions, PotE = perception of emotions of others, EXP = emotional expressivity, EMG = emotional management. *$p < .05$. **$p < .01$.

instrument are correlated above $r = .57$ ($p < .01$) with an average of $\Delta r = .73$ ($\Delta r = .57$ for the dimensions).

Referring to the scales of experiencing emotions (SEE), the perception of own emotions was positively correlated with the SEE factor *acceptance of own emotions* and negatively correlated with *experiencing lack of emotion* as expected. For the dimension perception of the emotions of others, positive correlations were found with the SEE factor *imaginative symbolization of emotions* that assesses to think imaginatively about emotions and thereby better understand others and oneself. For the dimension expressivity of emotions, we found a positive correlation with *physical symbolization of emotions* as expected and a negative correlation with the experiencing lack of emotion subscale. The dimension emotional management was positively correlated with the two emotion regulation subscales of the SEE: experience of emotion regulation $r = .51$ ($p < .01$) and experience of self-control $r = .36$ ($p < .01$).

Nomological and Discriminant Validity

For nomological and discriminant validity, we investigated the relationships with Big Five personality, self-efficacy, proactive decision-making, action regulation problems, time management, initial control, and positive self-motivation presented in Table 3 (more information regarding the comparison with MECQ-s and MECQ in Supplementary Material 1, Section 8). In terms of Big Five personality, we found positive correlations between the factors and dimensions of the MECQ-s with extraversion, agreeableness, and openness and as expected negative correlations with neuroticism. Regarding the individual factors and dimensions, there was evidence for negligible, weak, moderate, and a few strong effects for the relationship between EC and the Big Five personality as expected. Consistent with previous research (Stamouli, 2014), self-efficacy was positively related to reflexive handling of emotions, influencing one's own emotions, positive expressivity, and clarity of the perception of emotions ($r = .26$–$.53$). Decision-making was positively related to perspective-taking ($r = .34$, $p < .01$), influencing one's own emotions ($r = .30$, $p < .01$) and clarity of perception ($r = .29$, $p < .01$). There is evidence for a relationship for clarity of the perception of emotions with initiation control and action regulation ($r = .22$ and $-.28$, $p < .01$). The expected correlation with influencing one's own emotions was significant but below the cutoff. There was no meaningful relationship with time management as presented in Table 3.

Study 2

Test–Retest Reliability

A sample of 38 students was used to estimate test–retest reliability. The respondents filled out the MECQ-s two weeks after the first measurement. Section 9 in Supplementary Material 1 presents the mean, *SD* as well as Pearson correlations, and $ICC_{3,1}$ for the two measurement points. Factors and dimensions of the MECQ-s are correlated above $r = .69$ ($p < .01$) with an average of $\Delta r = .81$ (.80 for the dimensions). $ICC_{3,1}$ values were similar above .68 with an average of .80 for the factors and .79 for the dimensions. According to Fleiss et al. (2003), the found values can be considered as good (> .60) to excellent (> .75).

Study 3

Measurement Invariance

We investigated with an analysis of measurement invariance whether the items also measure the same structure in the MECQ-s as in the MECQ and are comparable in heterogeneous population samples. To examine measurement invariance between the groups that completed the long version and the groups that completed the short version, we used the MECQ-s 32 items and the same 32 items of the MECQ for the analysis, as suggested by Marsh et al. (2005). Using this approach, we found that the 32 items of the MECQ-s measured the same factors and had similar psychometrics as the corresponding 32 items of the long-version MECQ. Section 10 in Supplementary Material 1 shows the measurement invariance of Models 1, 4, and 3 for CFA and ESEM. The findings indicate that the instrument is invariant across groups that completed the long version and groups that completed the short version as well as across gender and age. Thus, the meaning of EC is the same in all subgroups and in both the long and short versions of the questionnaire, and the correlations with other constructs can be validly compared. For the configural and metric invariance models (CFA and ESEM for all models), the change of CFI, RMSEA, and SRMR were below the cutoff criteria (ΔCFI < .010, ΔRMSEA < .015, and ΔSRMR < .010) of Chen (2007). Therefore, the results indicate that dimensions and factors loadings are comparable across gender and age as well as groups that completed the short-version MECQ-s or the long-version MECQ. For scalar invariance, the findings revealed a less clear picture referring to age and groups that completed different versions of the questionnaire (MECQ-s or MECQ). For RMSEA and SRMR, the change of fit was mainly only marginal. The change of fit in CFI was above the cutoff criteria. Analyzing those findings at the item level indicate that especially two items of attention to own emotions and clarity of perception of emotions were sensitive for biases of measurement by the short or long version, while for age, one item of the expressivity dimension was sensitive for biases of subpopulations. After freeing the intercepts of Item 04 of clarity of the

perception of emotions (for ESEM, only the item of clarity of the perception of emotions) and Item 04 of attention to own emotions (items are named after the long-version MECQ) to be noninvariant for partial scalar measurement invariance for groups that completed different versions of the questionnaire (MECQ-s or MECQ), we found that the change of CFI, RMSEA, and SRMR were below the cutoff criteria. We achieved the same results by freeing Item 04 of positive expressivity (fun) for partial scalar measurement invariance of age (see Supplementary Material 1, Section 10 for further discussion).

Discussion

The aim of this research addressed the validation of the MECQ-s as a short and easy-to-administer questionnaire for measuring EC as a multidimensional construct. Therefore, we carried out a series of validation studies based on the recommendations by Smith et al. (2000). ESEM and CFA showed that the 11-factor structure had the best model fit, supporting the strong similarity of the short versions to the original long version of the MECQ. In addition, the MECQ-s 11-factor and four-dimensional structure (Model 4), which was also found in the initial development study (Gerbeth et al., 2021), showed acceptable model fit and almost the same Akaike information criterion and Bayesian information criterion as Model 1 for ESEM. Given the theoretical basis of EC, Model 4 thus supports, in addition to the 11 factors, the four theoretical content dimensions of perception of own and others' emotions, emotional expressivity, and emotional management (Davies, 1983; Gross & John, 1998; Roger & Nesshoever, 1987; Salovey et al., 1997).

The modelling of the factor structure using ESEM and its superiority over the factor structure based on CFA supported those interrelationships between factors and dimensions of EC. Furthermore, we extended the former findings of comparing the MECQ (long version) with the MECQ-s (short version). In a new independent sample testing both the MECQ-s and the MECQ at different time points during the survey, we could establish a direct comparison of items and factors.

We investigated with an analysis of measurement invariance whether the items also measure the same structure in the MECQ-s as in the MECQ and are comparable in heterogenous populations (gender and age). Therefore, we examined configural (equal factor structure), metric (equal factor loadings), and scalar measurement invariance (equal factors loadings and intercepts). For the configural and metric invariance, the results indicate that dimensions and factors loadings are comparable across gender and age as well as groups that completed the short-version MECQ-s or the long-version MECQ. We only found partial scalar invariance for groups that completed the short version or long version of the instrument. Further analysis showed that two items of clarity of perception of emotions and attention to own emotions caused the noninvariance. Analyzing those findings at the item level indicate that especially Item 04 of clarity of the perception of emotions and Item 04 of attention to own emotions used the same time-related term (*usually*) that could be the reason for the biases between the two groups. Especially, data of Sample 1 with the short version were collected during the COVID-19 pandemic, which could have caused a different understanding of the time-related term in the item wording.

In addition, convergent, nomological, and discriminant validity was established through the comparison with the scales of experiencing emotions (SEE), the Big Five personality, and self-efficacy as well as time management and proactive decision-making. The correlations with the SEE were medium-sized, as the SEE have a stronger relation to experienced emotions, while the MECQ-s focuses on the competences in dealing with them. Comparing the MECQ-s with the MECQ showed that the factors and the dimensions are highly related to the corresponding factors of the long version. For nomological and discriminant validity, expected relationships to the Big Five personality (Van Rooy et al., 2005) and self-efficacy were found as well as to positive self-motivation (Petrides, 2009). There was no evidence for a meaningful relationship between EC and time management as expected. Furthermore, there was evidence for the relationship of EC and decision-making that supports the findings from Di Fabio and Kenny (2012). According to reliabilities, the MECQ-s showed good Cronbach's α and McDonald's ω as well as good test–retest reliability despite its shortened length compared to the long version.

Limitations and Future Studies

While the present findings are encouraging and indicate that the MECQ-s provides consistent measurements of EC, important requests for future studies still remain. One such important limitation is the stability of the MECQ-s scores over time. Therefore, further longitudinal validation studies to examine the MECQ-s may prove beneficial. A related limitation is the factor structure of the MECQ-s. For CFA and ESEM, we had models with many parameters to be estimated. For this number of parameters, it is recommended to use particularly large samples for the analyses, which may result in our sample being too small. Future studies with larger sample sizes or

replication studies could help to further investigate the models we found. The 11-factor and four-dimension Model 4 had worse model fit than the 11-factor Model 1, which would argue statistically against Model 4. Further studies in a broader population and longitudinal studies could extend the findings of this study and help validate the hypothesized theoretical connectedness of the factors to the dimensions of EC. To compare our data with the development study, we collected data from teacher students. Therefore, our results are homogeneous in terms of domain specificity (academic context) and gender (high number of females in teacher education). Hence, another important issue is to examine the invariance across other interesting groups or domains. For example, a test to establish invariance across different groups of students regarding their studies and, also, measurement invariance testing for groups of professionals (e.g., teachers, healthcare professionals) and participants in other European countries are needed. Ekermans (2009) indicated that EC and its dimensions may be affected by cultural bias. In a study of LaPalme et al. (2016), there is evidence for differences between American and Chinese samples for the Wong and Law Emotional Intelligence Scale. Future studies should address any expected cultural bias at the item-content level and conduct comparative studies across cultures and countries.

Our data show that EC is positively related to three cornerstone personality constructs (Big Five personality, self-efficacy, and SEE) underlining the relevance and importance of investigating the concept of EC in future workplace research. Future research could examine the multidimensional conceptualization of EC at work in relation to job resources, demands, and work outcomes (such as workload, work engagement, burnout). Hence, from a practical point of view, employers are encouraged to assess EC and its single dimensions and factors of their employees to enhance their understanding of workplace acting and interacting.

Conclusion

Despite these limitations, the MECQ-s can contribute to a better understanding of individual differences in dealing with emotions. The findings of this validation study support that the MECQ-s is a reliable, valid self-report instrument that may encourage researchers and practitioners to assess, map, and describe or evaluate emotional competence. Not only does it depict an important addition to competence-based measurement instruments of EC, but it also adds a new approach, namely, a multidimensional approach. The beneficial conceptualization of EC as a multidimensional construct is represented in the MECQ-s with the 11-factor model based on CFA and ESEM. Furthermore, the four-dimension and 11-factor model supports the four theoretical content dimensions of EC. This study also contributes to the literature by extending the research on ESEM with complex multidimensional constructs such as emotional competence. Therefore, the value of ESEM in analyzing complex hierarchical structures becomes evident, especially when components of the investigated construct are interrelated. Compared to the original 109-item scale, the MECQ-s is a brief, high-quality instrument for assessing emotional competence including the perception of own and others' emotions, the emotional expressivity, and the emotional management. The MECQ-s can be used in several domains and, especially, if time is limited.

References

Asendorpf, J. B. (2018). *Persönlichkeit: was uns ausmacht und warum* [*Personality: what we are and why*]. Springer. https://doi.org/10.1007/978-3-662-56106-5

Bar-On, R. (2004). The Bar-On Emotional Quotient Inventory (EQ-i): Rationale, description and summary of psychometric properties. In G. Geher (Ed.), *Measuring emotional intelligence: Common ground and controversy* (pp. 115–145). Nova Science Publ.

Brauer, K., Ranger, J., & Ziegler, M. (2023). Confirmatory factor analyses in Psychological Test Adaptation and Development: A nontechnical discussion of the WLSMV estimator. *Psychological Test Adaptation and Development*, *4*(1), 4–12. https://doi.org/10.1027/2698-1866/a000034

Chen, F. F. (2007). Sensitivity of goodness of fit indices to lack of measurement invariance. *Structural Equation Modeling*, *14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*(1), 113–126. https://doi.org/10.1037/0022-3514.44.1.113

Di Fabio, A., & Kenny, M. E. (2012). The contribution of emotional intelligence to decisional styles among Italian high school students. *Journal of Career Assessment*, *20*(4), 404–414. https://doi.org/10.1177/1069072712448893

Ekermans, G. (2009). Emotional intelligence across cultures: Theoretical and methodological considerations. In J. D. A. Parker, D. H. Saklofske, & C. Stough (Eds.), *Springer series on human exceptionality. Assessing emotional intelligence: Theory, research, and applications* (1st ed., Vol. 39, pp. 259–290). Springer-Verlag. https://doi.org/10.1007/978-0-387-88370-0_14

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Fiori, M., & Antonakis, J. (2011). The ability model of emotional intelligence: Searching for valid measures. *Personality and Individual Differences*, *50*(3), 329–334. https://doi.org/10.1016/j.paid.2010.10.010

Fiorilli, C., Benevene, P., De Stasio, S., Buonomo, I., Romano, L., Pepe, A., & Addimando, L. (2019). Teachers' burnout: The role of

trait emotional intelligence and social support. *Frontiers in Psychology*, *10*, Article 2743. https://doi.org/10.3389/fpsyg.2019.02743

Fleiss, J. L., Levin, B., & Paik, M. C. (2003). *Statistical methods for rates and proportions* (3rd ed.). Wiley-Interscience. https://doi.org/10.1002/0471445428

Gerbeth, S., Stamouli, E., & Mulder, R. H. (2021). Development of the short scale of the Multidimensional Emotional Competence Questionnaire in a German sample. *SAGE Open*, *11*(2). https://doi.org/10.1177/21582440211009220

Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. *Personality and Individual Differences*, *102*, 74–78. https://doi.org/10.1016/j.paid.2016.06.069

Gross, J. J., & John, O. P. (1998). Mapping the domain of expressivity: Multimethod evidence for a hierarchical model. *Journal of Personality and Social Psychology*, *74*(1), 170–191. https://doi.org/10.1037//0022-3514.74.1.170

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2014). *Multivariate data analysis* (7th ed.). Pearson.

Joseph, D. L., Jin, J., Newman, D. A., & O'Boyle, E. H. (2015). Why does self-reported emotional intelligence predict job performance? A meta-analytic investigation of mixed EI. *The Journal of Applied Psychology*, *100*(2), 298–342. https://doi.org/10.1037/a0037681

Koran, J. (2020). Indicators per factor in confirmatory factor analysis: More is not always better. *Structural Equation Modeling: A Multidisciplinary Journal*, *27*(5), 765–772. https://doi.org/10.1080/10705511.2019.1706527

LaPalme, M. L., Wang, W., Joseph, D. L., Saklofske, D. H., & Yan, G. (2016). Measurement equivalence of the Wong and Law Emotional Intelligence Scale across cultures: An item response theory approach. *Personality and Individual Differences*, *90*, 190–198. https://doi.org/10.1016/j.paid.2015.10.045

MacCann, C., Jiang, Y., Brown, L. E. R., Double, K. S., Bucich, M., & Minbashian, A. (2020). Emotional intelligence predicts academic performance: A meta-analysis. *Psychological Bulletin*, *146*(2), 150–186. https://doi.org/10.1037/bul0000219

Marsh, H. W., Ellis, L. A., Parada, R. H., Richards, G., & Heubeck, B. G. (2005). A short version of the Self Description Questionnaire II: Operationalizing criteria for short-form evaluation with new applications of confirmatory factor analyses. *Psychological Assessment*, *17*(1), 81–102. https://doi.org/10.1037/1040-3590.17.1.81

Marsh, H. W., Lüdtke, O., Muthén, B., Asparouhov, T., Morin, A. J. S., Trautwein, U., & Nagengast, B. (2010). A new look at the big five factor structure through exploratory structural equation modeling. *Psychological Assessment*, *22*(3), 471–491. https://doi.org/10.1037/a0019227

Martins, A., Ramalho, N., & Morin, E. (2010). A comprehensive meta-analysis of the relationship between emotional intelligence and health. *Personality and Individual Differences*, *49*(6), 554–564. https://doi.org/10.1016/j.paid.2010.05.029

Maul, A. (2012). The validity of the Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT) as a measure of emotional intelligence. *Emotion Review*, *4*(4), 394–402. https://doi.org/10.1177/1754073912445811

Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey, & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (1st ed., pp. 3–41). Basic Books.

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion*, *3*(1), 97–105. https://doi.org/10.1037/1528-3542.3.1.97

Mestre, J. M., MacCann, C., Guil, R., & Roberts, R. D. (2016). Models of cognitive ability and emotion can better inform contemporary emotional intelligence frameworks. *Emotion Review*, *8*(4), 322–330. https://doi.org/10.1177/1754073916650497

Miao, C., Humphrey, R. H., & Qian, S. (2017). A meta-analysis of emotional intelligence and work attitudes. *Journal of Occupational and Organizational Psychology*, *90*(2), 177–202. https://doi.org/10.1111/joop.12167

O'Boyle, E. H., Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance: A meta-analysis. *Journal of Organizational Behavior*, *32*(5), 788–818. https://doi.org/10.1002/job.714

O'Connor, P. J., Hill, A., Kaya, M., & Martin, B. (2019). The measurement of emotional intelligence: A critical review of the literature and recommendations for researchers and practitioners. *Frontiers in Psychology*, *10*, Article 1116. https://doi.org/10.3389/fpsyg.2019.01116

Petrides, K. V. (2009). Psychometric Properties of the Trait Emotional Intelligence Questionnaire (TEIQue). In J. Parker, D. Saklofske, & C. Stough (Eds.), *Assessing emotional intelligence* (pp. 85–101). https://doi.org/10.1007/978-0-387-88370-0_5

Petrides, K. V., Frederickson, N., & Furnham, A. (2004). The role of trait emotional intelligence in academic performance and deviant behavior at school. *Personality and Individual Differences*, *36*(2), 277–293. https://doi.org/10.1016/S0191-8869(03)00084-9

Petrides, K. V., & Furnham, A. (2003). Trait emotional intelligence: Behavioural validation in two studies of emotion recognition and reactivity to mood induction. *European Journal of Personality*, *17*(1), 39–57. https://doi.org/10.1002/per.466

Roger, D., & Nesshoever, W. (1987). The construction and preliminary validation of a scale for measuring emotional control. *Personality and Individual Differences*, *8*(4), 527–534. https://doi.org/10.1016/0191-8869(87)90215-7

Rossen, E., Kranzler, J. H., & Algina, J. (2008). Confirmatory factor analysis of the Mayer–Salovey–Caruso Emotional Intelligence Test V 2.0 (MSCEIT). *Personality and Individual Differences*, *44*(5), 1258–1269. https://doi.org/10.1016/j.paid.2007.11.020

Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1997). Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale. In J. W. Pennebaker (Ed.), *Emotion, disclosure, et health* (2nd ed., pp. 125–154). American Psychological Association. https://doi.org/10.1037/10182-006

Sánchez-Álvarez, N., Berrios Martos, M. P., & Extremera, N. (2020). A meta-analysis of the relationship between emotional intelligence and academic performance in secondary education: A multi-stream comparison. *Frontiers in Psychology*, *11*, Article 1517. https://doi.org/10.3389/fpsyg.2020.01517

Sánchez-Álvarez, N., Extremera, N., & Fernández-Berrocal, P. (2016). The relation between emotional intelligence and subjective well-being: A meta-analytic investigation. *The Journal of Positive Psychology*, *11*(3), 276–285. https://doi.org/10.1080/17439760.2015.1058968

Scherer, K. R. (2005). What are emotions? And how can they be measured?. *Social Science Information*, *44*(4), 695–729. https://doi.org/10.1177/0539018405058216

Schutte, N. S., Malouff, J. M., & Bhullar, N. (2009). The Assessing Emotions scale. In J. D. A. Parker, D. H. Saklofske, & C. Stough (Eds.), *Springer series on human exceptionality. Assessing emotional intelligence: Theory, research, and applications* (1st ed., pp. 119–134). Springer-Verlag. https://doi.org/10.1007/978-0-387-88370-0_7

Siemer, M., Mauss, I., & Gross, J. J. (2007). Same situation – different emotions: How appraisals shape our emotions. *Emotion*, *7*(3), 592–600. https://doi.org/10.1037/1528-3542.7.3.592

Smith, G. T., McCarthy, D. M., & Anderson, K. G. (2000). On the sins of short-form development. *Psychological Assessment*, *12*(1), 102–111. https://doi.org/10.1037//1040-3590.12.1.102

Stamouli, E. (2014). *Emotionale Kompetenz als Bestandteil beruflichen Handelns. Studien zur Berufs- und Professionsforschung: Vol. 20* [Emotional competence as a component of professional action. Studies in occupational and professional research: Vol. 20]. Verlag Dr. Kovac.

Stamouli, E., & Gerbeth, S. (2021). The moderating effect of emotional competence on job satisfaction and organisational commitment of healthcare professionals. *BMC Health Services Research*, *21*, Article 1257. https://doi.org/10.1186/s12913-021-07234-1

Stamouli, E., Mehringer, V., Luger, B., Loew, T., & Gruber, H. (2006). *Emotionale Kompetenz – Entwicklung eines multidimensionalen Messinstruments (Forschungsbericht Nr. 20)* [Emotional competence – Development of a multidimensional measuring instrument (Research Report No. 20)]. University of Regensburg.

Thomas, C. L., Cassady, J. C., & Heller, M. L. (2017). The influence of emotional intelligence, cognitive test anxiety, and coping strategies on undergraduate academic performance. *Learning and Individual Differences*, *55*(2), 40–48. https://doi.org/10.1016/j.lindif.2017.03.001

Van Kleef, G. A. (Ed.). (2016) *The interpersonal dynamics of emotion*. Cambridge University Press. https://doi.org/10.1017/CBO9781107261396

Van Rooy, D. L., Viswesvaran, C., & Pluta, P. (2005). An evaluation of construct validity: What is this thing called emotional intelligence? *Human Performance*, *18*(4), 445–462. https://doi.org/10.1207/s15327043hup1804_9

Zinbarg, R. E., Revelle, W., Yovel, I., & Li, W. (2005). Cronbach's α, Revelle's β, and Mcdonald's ω: Their relations with each other and two alternative conceptualizations of reliability. *Psychometrika*, *70*(1), 123–133. https://doi.org/10.1007/s11336-003-0974-7

History
Received October 4, 2022
Revision received April 11, 2023
Accepted April 17, 2023
Published online June 27, 2023

Section: Personality

Acknowledgments
The authors express their gratitude to Regina H. Mulder for her support and comments.

Publication Ethics
All procedures in studies involving human participants were performed in accordance with the ethical standards of the institution's Human Research Ethics Committee. Ethical clearance was obtained from the University Regensburg Ethics Committee (No. 20-1879-101) prior to data collection. Student participation was voluntary, and informed consent was given by all participants.

Authorship
S.G. and E.S. – Conceptualization, Methodology, and Investigation; S.G. – Writing – Original Draft; S.G. and E.S. – Writing – Review & Editing. All authors approved the final version of the article.

Open Science
We report how we determined our sample size, all data exclusions (if any), all data inclusion/exclusion criteria, whether inclusion/exclusion criteria were established prior to data analysis, all measures in the study, and all analyses including all tested models. If we use inferential tests, we report exact *p*-values, effect sizes, and 95% confidence or credible intervals.

Open Data: The data that support the findings of this study are available on reasonable request from the corresponding author. The data are not publicly available due to privacy restrictions.

Open Material: The information needed to reproduce all of the reported methodology is available on reasonable request from the corresponding author. Preregistration: This study was not preregistered.

Supplementary Material 1, 2, and 3 are available at https://doi.org/10.17605/OSF.IO/WM9SA.

ORCID
Sebastian Gerbeth
https://orcid.org/0000-0001-9361-4324
Elena Stamouli
https://orcid.org/0000-0003-2244-8386

Sebastian Gerbeth
Faculty of Human Sciences
UR – University of Regensburg
Universitätsstrasse 31
93040 Regensburg
Germany
sebastian.gerbeth@ur.de