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Social Support and Adolescent Emotional Competence in Slovakia and China: Cross-Cultural Implications for Sustainable Education

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Abstract

Emotional competence underpins adolescent well-being and represents an important dimension of socio-emotional learning relevant to the United Nations Sustainable Development Goals (SDGs 3 and 4). This study examined the associations between perceived family, school, and peer support and three dimensions of emotional competence—emotional regulation, empathy, and self-control—among adolescents aged 10–15 years in Slovakia (n = 268) and China (n = 253). Cross-sectional survey data were analyzed using country-specific and multi-group structural equation modeling (SEM), with robust maximum likelihood estimation employed for sensitivity analyses. In the Slovak sample, family, school, and peer support were positively associated with emotional regulation; school and peer support with empathy; and family and school support with self-control. In the Chinese sample, family and peer support were positively associated with emotional regulation; peer support with empathy; and all three sources of support with self-control. Formal cross-country comparisons did not identify statistically significant differences in the nine structural paths after correction for multiple comparisons. Nevertheless, the estimated association between peer support and emotional regulation was more pronounced in the Chinese sample, although this difference was not statistically robust after multiple-comparison correction. These findings highlight the relevance of supportive family, school, and peer relationships to adolescent emotional competence in both contexts, while suggesting that potential contextual variations in these associations warrant further investigation.

Keywords: adolescence; emotional competence; social support; cross-cultural study; social-emotional learning; sustainable education; quality education (SDG 4); well-being

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1. Introduction

1.1. Emotional Competence

Adolescence represents a critical developmental period marked by increased emotional complexity, cognitive maturation, and growing social independence [1]. During this stage, individuals encounter a range of emotional challenges associated with identity formation, academic demands, and evolving peer and family dynamics [1,2]. Emotional competence is typically defined as the individuals' capability to understand and manage their emotions, as well as the ability to empathize with other's emotions and respond to the emotions appropriately [3,4]. Therefore, it is a multidimensional construct involving emotional regulation,

self-control, and empathy [5]. Emotional regulation allows adolescents to monitor internal emotional states and express emotions appropriately; empathy supports the development of affective and cognitive skills to notice and consider emotional states of others; and self-control facilitates the regulation of impulses and long-term goal-directed behaviour [5–8]. These emotional capacities are central to adolescents' mental health, academic success, and long-term psychosocial adjustment. A meta-analysis work synthesizing 185 studies demonstrated that high-level emotional competence serves as a protective factor against adolescent anxiety [9]. Also, longitudinal evidence showed adolescent emotional competence plays a significant role in shaping future psychological adjustment [10]. And, there was empirical evidence proving that emotional competence can predict adolescent academic engagement and achievement [11,12]. Therefore, understanding the factors associated with emotional competence during adolescence has become one of the major focuses of developmental and educational psychology.

Beyond their direct associations with emotional development, social support and emotional competence have also been examined within broader frameworks of positive psychological functioning. Previous research has linked perceived social support and emotional intelligence to subjective well-being and life satisfaction. For example, research among adolescents has identified associations among social support, emotion regulation, resilience, and life satisfaction [13]. Furthermore, some researchers found that perceived social support and resilience were positively associated with prosocial behaviour in adolescents, highlighting the relevance of supportive social environments to positive social functioning [14]. From an individual psychological perspective, emotional self-efficacy and self-esteem have also been linked longitudinally [15], suggesting that beliefs about emotional capabilities may form part of a broader network of psychological resources. Together, these findings provide complementary theoretical perspectives on the relationships between social support, emotional competence, and adolescent psychosocial adjustment.

1.2. Social Support

Social support is an influential contextual factor associated with adolescent affective development [16,17]. According to the ecological system theory, the micro-system—comprising the immediate environments with which adolescents directly interact—exerts the most direct influence on their psychological development [18]. Key components of the microsystem typically include family, school, and peer relationships. Family support, as the earliest and often most stable source of socialization, plays a key role in shaping emotional development. According to the tripartite model of emotion socialization, family environments influence adolescent emotional development through observational learning, emotion-related parenting practices (e.g., emotion coaching), and the broader emotional climate [19]. Thus, theoretically, a warm and supportive family climate may help adolescents to express and regulate emotions constructively.

In addition to the family, school is a central socialization context, particularly in adolescence. Positive teacher–student relationship fosters adolescents' active participation in academic learning, emotional health and behavioural self-regulation [20]. Moreover, the structured nature of the school environment offers opportunities to learn social norms and emotional self-regulation [21]. The empirical evidence suggested that the safe school climate and feeling connected to school are protective for emotional well-being during the transition from early to middle adolescence, which is a turbulent stage in life-span development [22]. Longitudinally, a structuring and supportive school style positively influences social-emotional development over the whole late adolescence [23].

Peer support also becomes increasingly salient during adolescence, when individuals spend more time with age-mates and seek greater autonomy from their families [24].

Peers provide both emotional validation and practical advice, offering adolescents valuable opportunities to experience reciprocal relationships, resolve conflicts, and develop social-cognitive skills such as empathy [24,25]. The interventional study directly proved that peer support training promotes emotional skills among adolescents [26].

1.3. Cultural Differences

Although all three sources of support are theoretically important, their exact influence on adolescent emotional competence remains unclear and may vary depending on broader cultural contexts. Culture shapes not only how social support is experienced and interpreted but also how emotional competence is valued and fostered. In Central European countries (e.g., Slovakia) where individualistic cultures tend to dominate, emotional expression, autonomy, and peer affiliation are often emphasized. Adolescents in these cultures are typically encouraged to express feelings, seek help from non-familial members and engage in emotionally supportive peer relationships [27,28]. Consequently, school and peer support might be expected to play stronger roles in promoting emotional expression and empathy in these contexts. In contrast, East Asian countries, (e.g., China), are often characterized by collectivist values that prioritize academic achievement, social harmony, and emotional restraint. In such contexts, family authority remains central, and educational systems tend to emphasize discipline and competition over emotional development [29,30]. These cultural norms may shape adolescents' perceptions of support and the emotional functions of school and peer environments. At the same time, norms of emotional restraint toward parents and teachers may make peers a particularly important outlet for emotional sharing among Chinese adolescents, who typically spend long school days with the same classmates over several years. Peer support could therefore also be influential in China, albeit for different reasons. Given these competing expectations, the relative importance of each support source in the two countries remains an open empirical question.

From a sustainability perspective, adolescents' emotional competence is more than an individual developmental outcome. The 2030 Agenda for Sustainable Development commits countries to promoting mental health and well-being (Target 3.4) and to quality education that gives learners the knowledge and skills needed for sustainable development (Target 4.7) [31]. UNESCO's learning objectives for the SDGs explicitly include a socio-emotional domain alongside cognitive and behavioural learning. This domain covers self-reflection, empathy, collaboration and the regulation of one's own behaviour [32]. Similarly, the OECD treats social and emotional skills as a core outcome of education systems rather than a by-product of academic learning [33]. Emotional regulation, empathy and self-control are therefore building blocks of the social dimension of sustainability. They support long-term mental health, cooperative relationships and constructive participation in society. Identifying which social contexts nurture these competencies, and how this differs across education systems, can inform more sustainable and holistic educational policy.

1.4. Research Aim

Despite the growing body of research on the relationship between social support and adolescent mental health, significant gaps still remain. First, although numerous studies have examined the role of social support in promoting adolescent psychological well-being, empirical evidence specifically linking social support to adolescent emotional competence remains limited and inconclusive. Second, most existing studies have been conducted within single-country contexts, overlooking the possibility that cultural factors may moderate the influence of social support on emotional development. To address these gaps, the present study aimed to investigate the associations between perceived social support—from family, school, and peers—and emotional competence, defined in terms of emotional regulation,

empathy, and self-control, among adolescents in Slovakia and China, which have distinct cultural norms and educational systems, thereby informing culturally sensitive approaches to sustainable, holistic education.

2. Materials and Methods

2.1. Participants

Participants were recruited using a two-stage random sampling procedure in both countries. In the first stage, 13 schools were randomly selected in Slovakia, whereas two schools were randomly selected from Sichuan Province, China. In the second stage, students aged 10–15 years were randomly sampled from the corresponding grade levels within the selected schools. The final sample consisted of 268 Slovak adolescents (51.5% female; M_age = 12.84, SD = 1.32) and 253 Chinese adolescents (57.7% female; M_age = 13.38, SD = 0.99). Although the number of participating schools differed between countries, the resulting student sample sizes were comparable. Nevertheless, the geographical restriction of the Chinese sample and the limited number of participating schools should be considered when interpreting the generalizability of the findings. Response rates and additional socioeconomic information were not available in the analytical dataset.

2.2. Ethical Considerations and Data Collection

Data were collected in both countries using the same series of structured questionnaires. Participation was voluntary and anonymous, and informed consent was obtained from both the students and their parents. All measurement scales were originally developed in English and were adapted into Slovak and Chinese using the same translation and back-translation procedure. The original English items were first translated into the respective local languages and subsequently back-translated into English. The back-translated versions were compared with the original items, and identified discrepancies were addressed through further translation and revision to improve linguistic and conceptual consistency across the two language versions.

In Slovakia, the data collection procedures followed the ethical guidelines outlined in the Code of Ethics of the Psychological Profession (2017) and the Code of Ethics of the Slovak Chamber of Psychologists (2015). Data collection complied with the relevant legal and ethical standards for data protection: Act No. 18/2018 Coll. and Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016.

In China, the study followed the Ethical Guidelines for Clinical and Counselling Psychology Practice (2018) issued by the Chinese Psychological Society, particularly regarding research with minors and confidentiality [34]. In both countries, all data were used exclusively for research purposes and were kept strictly confidential.

The study was conducted in accordance with the applicable professional ethical guidelines and data protection requirements in Slovakia and China, with institutional permission from Pan-European University. Informed consent was obtained from all participating adolescents and their parents.

2.3. Measurements

2.3.1. Measurement for Social Support

The social support was assessed by the Belief in Others Scale [5], with three dimensions: family support (e.g., "My family members really help and support one another"), school support (e.g., "At my school, there is a teacher or some other adult who listens to me when I have something to say"), and peer support (e.g., "I have a friend my age who helps me when I'm having a hard time"). Each dimension was measured by three questions from

1 ("not at all true of me") to 4 ("very much true of me"). The overall scale demonstrated acceptable internal consistency in the Slovak sample (Cronbach's $\alpha = 0.78$) and good internal consistency in the Chinese sample (Cronbach's $\alpha = 0.88$). Subscale-specific reliability analyses showed that Cronbach's α ranged from 0.696 to 0.876 in Slovakia and from 0.792 to 0.947 in China, while McDonald's ω ranged from 0.709 to 0.879 and from 0.804 to 0.948, respectively. Detailed reliability estimates for family, school, and peer support are presented in Supplementary Table S4. We used the R (version 0.7-3, Ghent, Belgium) package "lavaan" to conduct the CFA. The results suggested the model fit was good overall (CFI = 0.99, TLI = 0.99, SRMR = 0.03, RMSEA = 0.04). Measurement invariance of the Social Support Scale was examined across the Slovak and Chinese samples using multi-group confirmatory factor analysis. The configural model demonstrated good fit (CFI = 0.991, RMSEA = 0.045, SRMR = 0.033). Constraining factor loadings to equality resulted in minimal changes in model fit (ΔCFI = −0.005, ΔRMSEA = 0.007, ΔSRMR = 0.010). Additional constraints on item intercepts produced similarly small changes (ΔCFI = −0.004, ΔRMSEA = 0.004, ΔSRMR = 0.003). Although chi-square difference tests were significant, changes in approximate fit indices were within commonly recommended thresholds [35], providing support for approximate metric and scalar invariance across the two cultural groups.

2.3.2. Measurement for Emotional Competence

The four-point Emotional Competence Scale [5] was adopted to measure adolescents' emotional competence. Participants were asked to answer questions in terms of their emotional regulation (e.g., "I accept responsibility for my actions"), empathy (e.g., "I feel bad when someone gets his or her feelings hurt"), and self-control (e.g., "I can wait for what I want") from 1 ("not at all true of me") to 4 ("very much true of me"). The overall scale demonstrated good internal consistency in both Slovakia (Cronbach's $\alpha = 0.84$) and China (Cronbach's $\alpha = 0.90$). At the subscale level, Cronbach's α ranged from 0.714 to 0.803 in Slovakia and from 0.800 to 0.862 in China. Corresponding McDonald's ω coefficients ranged from 0.716 to 0.811 and from 0.801 to 0.864, respectively. Detailed reliability estimates for emotional regulation, empathy, and self-control are provided in Supplementary Table S4. For the Emotional Competence Scale, the configural model also showed acceptable fit (CFI = 0.974, RMSEA = 0.065, SRMR = 0.035). Metric invariance was supported, with negligible changes in model fit (ΔCFI = −0.002, ΔRMSEA = −0.001, ΔSRMR = 0.007) and a nonsignificant chi-square difference test ($\Delta\chi^2(6) = 10.32$, $p = 0.112$). Although the scalar model yielded a significant chi-square difference ($\Delta\chi^2(6) = 17.81$, $p = 0.007$), changes in approximate fit indices remained within the recommended thresholds (ΔCFI = −0.006, ΔRMSEA = 0.003, ΔSRMR = 0.005), providing support for approximate scalar invariance.

Given the four-point ordinal response format, supplementary measurement invariance analyses were conducted using the WLSMV estimator, treating the items as ordered categorical indicators. Configural, threshold, and factor-loading invariance were examined sequentially across the Slovak and Chinese samples. Threshold invariance was supported for both scales. For Emotional Competence, additional loading constraints did not significantly worsen model fit. Although the corresponding chi-square difference test for Social Support was significant, changes in approximate fit indices were minimal (ΔCFI = −0.001, ΔRMSEA = 0.002, ΔSRMR = 0.000). Overall, these findings provide evidence consistent with approximate measurement invariance across the two samples, suggesting that the measurement properties are sufficiently comparable to support cautious cross-country comparisons of structural relationships. Detailed results are presented in Supplementary Table S1.

2.4. Data Analysis

We first utilised SPSS 25.0 to conduct descriptive statistics to summarise the sample characteristics. Subsequently, the R packages "psych" and "lavaan" were employed to perform psychometric analyses to assess the reliability and validity of the measurements. The core analysis—structural equation modelling (SEM)—was conducted using "lavaan" to examine the relationships between adolescents' perceived social support and emotional competence.

The primary confirmatory factor analyses (CFA) and structural equation models (SEM) were estimated using maximum likelihood (ML) in the R package lavaan, treating the four-point Likert-type items as approximately continuous indicators. Conventional ML standard errors and model fit statistics were used in the primary analyses. Although continuous-variable estimation can provide useful estimates under certain conditions, treating ordinal indicators as continuous may affect parameter estimation and statistical inference, particularly when the number of response categories is limited [36]. No missing values were identified in the 18 questionnaire items or the age and sex covariates. Consequently, all 521 participants (Slovakia: $n = 268$; China: $n = 253$) were retained in the analyses, without missing-data imputation. School- and classroom-level clustering was not modelled because corresponding identifiers were unavailable in the analytical dataset. Structural path coefficients reported in the text and in Figures 1 and 2 were estimated with latent factor variances fixed at 1 (std.lv = TRUE) and observed variables standardized before estimation (std.ov = TRUE); fully standardized coefficients (β, Std.all) are reported alongside them in Supplementary Table S3.

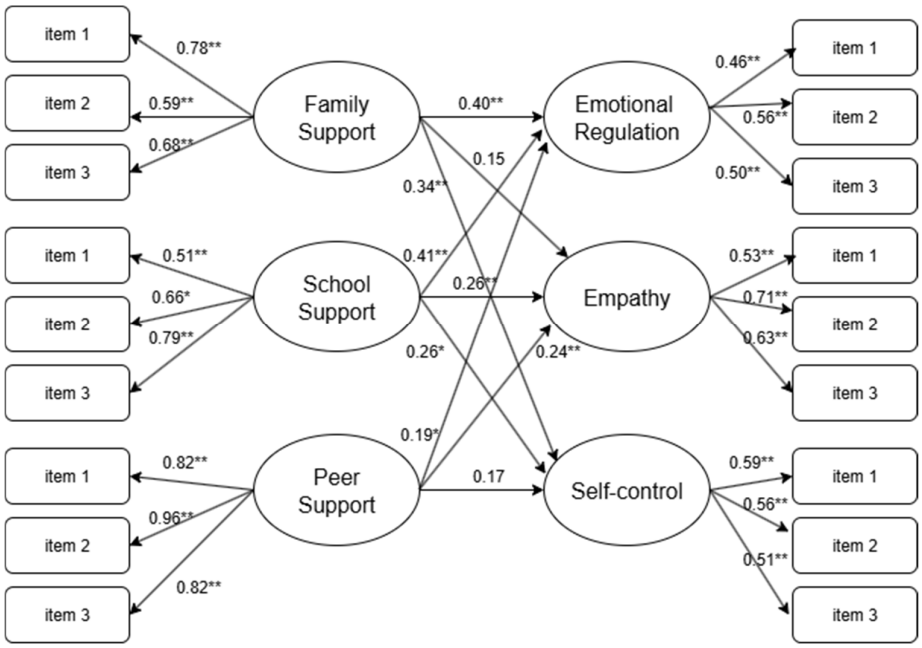


Figure 1. The SEM showing the associations of social supports and emotional competence among Slovak adolescents. Note: Values are model-estimated path coefficients and factor loadings; see Section 2.4. * $p < 0.05$, ** $p < 0.01$.

To evaluate the sensitivity of the findings to estimation assumptions, two supplementary analyses were conducted. First, measurement invariance was additionally examined using the weighted least squares mean- and variance-adjusted (WLSMV) estimator, treating the items as ordered categorical indicators and explicitly modelling their thresholds (Supplementary Table S1). Second, the structural models and cross-country path comparisons were re-estimated using robust maximum likelihood (MLR) to evaluate the sensitivity of statistical inference to departures from multivariate normality. Simulation evidence suggests that MLR may offer advantages over WLSMV

in estimating latent-factor correlations and associated standard errors under certain conditions involving relatively small samples and nonnormal latent distributions, although WLSMV generally provides more accurate factor-loading estimates [37]. Given the sample sizes in the present study (Slovakia: $n = 268$; China: $n = 253$), MLR was considered a useful complementary approach for assessing the stability of structural estimates and their statistical inference. The results were presented in Supplementary Table S2.

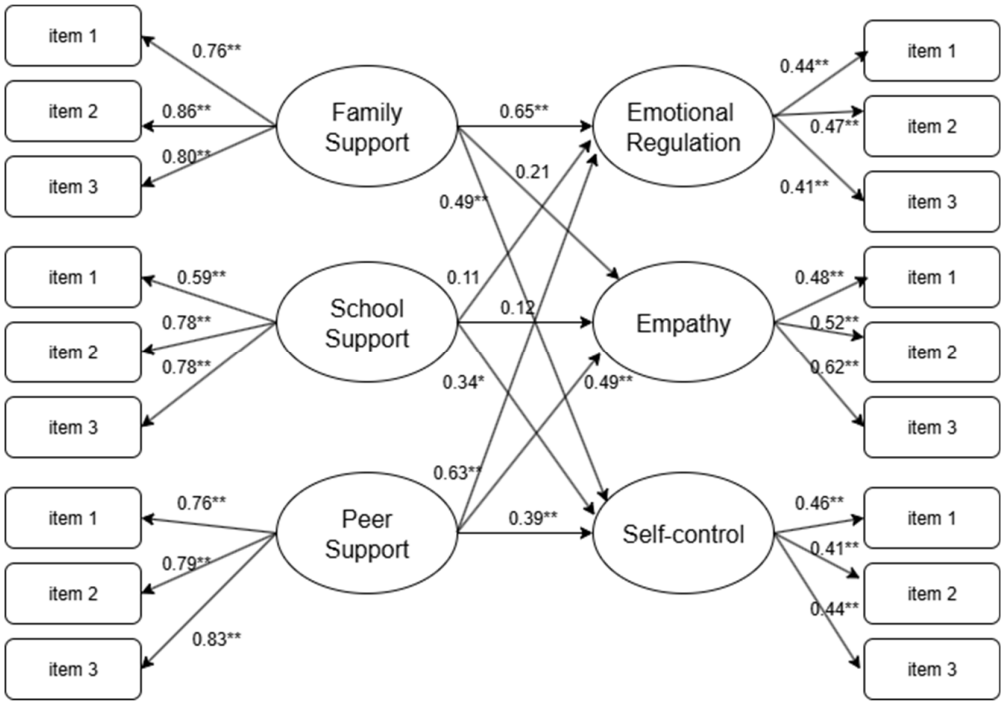


Figure 2. The SEM showing the associations of social supports and emotional competence among Chinese adolescents. Note: Values are model-estimated path coefficients and factor loadings; see Section 2.4. * $p < 0.05$, ** $p < 0.01$.

3. Results

3.1. Descriptive Statistics

The sample characteristics and descriptive statistics are displayed in Table 1.

Table 1. Sample characteristics and descriptive statistics.

	N	Mean	Std.Dev	N	Mean	Std.Dev
		Slovakia			China	
Male	130			107		
Female	138			146		
Age	268	12.84	1.32	253	13.38	0.99
Emotional Regulation	268	3.05	0.73	253	3.09	0.74
Empathy	268	2.98	0.77	253	2.83	0.75
Self-control	268	2.87	0.76	253	3.06	0.70
Family support	268	3.15	0.77	253	2.97	0.84
School support	268	2.76	0.77	253	2.72	0.80
Peer support	268	2.87	0.99	253	3.17	0.82

3.2. Structural Equation Model Based on Slovak Sample

After controlling for sex and age, the structural equation model (SEM) demonstrated that family, school, and peer supports were all positively and significantly associated with adolescent emotional regulation (see Figure 1). The coefficients for family support ($b = 0.40$, $p < 0.01$) and school support ($b = 0.41$, $p < 0.01$) were similar in the Slovakia group (see Figure 1). However, the coefficient for peer support was smaller ($b = 0.19$, $p = 0.04$). Furthermore, the results suggested empathy was not associated with family support significantly ($b = 0.15$, $p = 0.09$), while it linked to school support ($b = 0.26$, $p < 0.01$) and peer support positively ($b = 0.24$, $p < 0.01$). Regarding the final dimension of emotional competence, self-control, it associated with family ($b = 0.34$, $p < 0.01$) and school support ($b = 0.26$, $p = 0.02$) significantly. However, there was no significant relationship between self-control and peer support ($b = 0.17$, $p = 0.07$). The model fit was good (CFI = 0.95, TLI = 0.94, SRMR = 0.06, RMSEA = 0.05).

3.3. SEM Based on Chinese Sample

Among Chinese adolescents (see Figure 2), emotional regulation was not significantly associated with school support ($b = 0.11$, $p = 0.42$). Emotional regulation was significantly associated with family ($b = 0.65$, $p < 0.01$) and peer support ($b = 0.63$, $p < 0.01$) according to the SEM. The results also revealed that empathy was not significantly associated with school support ($b = 0.12$, $p = 0.37$) and family support ($b = 0.21$, $p = 0.07$), while it was related to peer support ($b = 0.49$, $p < 0.01$). Finally, self-control was significantly associated with all types of social support, family ($b = 0.49$, $p < 0.01$), school ($b = 0.34$, $p = 0.02$), and peer support ($b = 0.39$, $p < 0.01$). The model fit was good (CFI = 0.95, TLI = 0.94, SRMR = 0.05, RMSEA = 0.06).

3.4. Differences in the SEM Between Slovak and Chinese Samples

The country-specific SEM analyses revealed different patterns of associations between social support and emotional competence among Slovak and Chinese adolescents. Regarding emotional regulation, family, school, and peer support were significantly associated with emotional regulation in the Slovak sample, whereas only family and peer support showed significant associations in the Chinese sample. Regarding empathy, school and peer support were significantly associated with empathy in Slovakia, while only peer support was significantly associated with empathy in China. For self-control, family and school support showed significant associations in Slovakia, whereas all three sources of support were significantly associated with self-control in China. In the structural models, family support, school support, and peer support were specified as correlated exogenous latent variables, which were freely allowed to covary in the structural models. Age and sex were included as covariates predicting emotional regulation, empathy, and self-control. Figures 1 and 2 illustrate the focal relationships between social support and emotional competence, while complete regression estimates, including covariate coefficients, standard errors, confidence intervals, and explained variance (R^2), are provided in Supplementary Table S3.

To formally examine whether the structural associations differed between the Slovak and Chinese samples, multi-group SEM was conducted with factor loadings constrained to equality across groups. Because factor loadings were held equal across groups in this model, the between-country differences in path coefficients (Δb) are estimated on a common metric and therefore do not exactly equal the differences between the country-specific estimates reported in Sections 3.2 and 3.3. The overall test constraining the nine focal structural paths to equality was not statistically significant ($\Delta\chi^2(9) = 11.37$, $p = 0.252$). Individual cross-country path comparisons were subsequently conducted with Holm correction for multiple comparisons. Among the nine paths, the association between peer support and emotional regulation showed the strongest evidence of a between-country difference (b difference = −0.355, Slovakia minus China; z = −2.69, unadjusted $p = 0.007$). How-

ever, this difference did not remain statistically significant after Holm correction (adjusted $p = 0.065$). None of the other structural paths showed significant between-country differences after correction (all adjusted p values > 0.05).

Sensitivity analyses using robust maximum likelihood (MLR) estimation yielded the same coefficient differences (Δb). The overall cross-country comparison remained nonsignificant (scaled $\Delta\chi^2(9) = 8.90$, $p = 0.447$). For the peer support–emotional regulation path, the robust standard error was larger than that obtained using conventional ML estimation (0.171 versus 0.132), resulting in an unadjusted p-value of 0.037 and a Holm-adjusted p-value of 0.337. Although neither estimation approach provided statistically significant evidence of a between-country difference after correction for multiple comparisons, the estimated association between peer support and emotional regulation was consistently stronger in the Chinese sample. This descriptive pattern is therefore of potential theoretical interest, but should not be interpreted as conclusive evidence of a population-level cross-country difference (Supplementary Table S2).

4. Discussion

This study examined whether the associations between perceived social support and emotional competence differed between Slovak and Chinese adolescents, considering the potentially different cultural and educational contexts of the two samples.

The country-specific analyses showed somewhat different patterns of association for emotional regulation in the two samples. In the Slovak sample, emotional regulation was significantly associated with family, school, and peer support, whereas in the Chinese sample only family and peer support showed significant associations. However, the formal cross-country comparison of the school support–emotional regulation path was not statistically significant after Holm correction, so this pattern should not be taken as evidence that school support matters less for emotional regulation in China. As a tentative contextual hypothesis, examination-oriented educational practices in China may be relevant to how school support is experienced [38]. Previous literature has described the Chinese exam-oriented education system as a reflection of collectivist cultural values, wherein academic achievement is not only a personal goal but also a familial and societal expectation. Within this system, educational success is viewed as a means to uphold family and school honour and contribute to social mobility, reinforcing interdependent self-construal and group-based performance pressure [39]. Some authors have argued that the collective emphasis on standardized assessments and competitive rankings reflects broader collectivist tendencies that prioritize conformity, discipline, and group reputation over individual expression and emotional development [40]. Notably, success in these exams is not determined by absolute scores but rather by relative ranking among peers. As such, the educational system in China is designed to equip students to be competitive in exams [41]. If so, affective development may receive comparatively limited attention in some Chinese schools, and school support may be experienced as more closely tied to academic performance than to affective needs. However, the present study did not measure cultural values, educational practices, or the content of school support, and the Chinese sample was drawn from two schools in one province; these explanations therefore remain hypotheses for future research rather than established mechanisms.

The finding of the significant correlation between family support and emotional regulation in both Slovakia and China aligns with a tripartite model, which suggests family contexts are theoretically linked to adolescent emotional regulation: observation, parenting practice (specifically referring to the emotion coaching in this model), and emotional climate [42]. Of these, emotional climate particularly means the positive or negative emotions displayed between family members, usually reflected by family relationship quality.

Family support, by enabling adolescents to discuss stresses and problems and by showing acceptance of their negative emotions, is potentially relevant to a positive family emotional climate. Such a supportive environment may provide adolescents with a sense of affective security, which besides may offer parents opportunities to coach emotion-related coping strategies. Hence, family support may be an important correlate of adolescent emotional regulation. Consistent with our findings, study with a Spanish sample also indicated that family support has a stronger association with adolescent emotional regulation compared to other types of social support [13].

Although formal cross-country comparisons did not identify a statistically significant difference after correction for multiple comparisons, the estimated association between peer support and emotional regulation was more pronounced in the Chinese sample. This descriptive pattern was consistent across the ML and MLR estimation approaches, although the evidence for a population-level cross-country difference remained inconclusive. Several contextual explanations may be considered. First, norms of emotional restraint in hierarchical relationships may be associated with Chinese adolescents sharing emotions with peers rather than with parents or teachers, making peers a primary setting for practising emotion regulation. Second, Chinese students usually remain in the same class cohort for several years and spend long school days together, so classmates form a stable in-group with which adolescents interact intensively. Third, Chinese parents often guide their children's friendships, encouraging them to befriend peers who show high achievement and strong academic performance [43], with the aim that children will imitate these peers' study habits and personalities. Peer networks shaped in this way may model self-discipline and emotional control, so peer support may be more closely tied to emotional regulation in the Chinese context. In Western contexts, by contrast, adolescents select friends more autonomously, and these friends tend to share similar status, values and personalities [44], which may be associated with a more limited incremental role of peer relationships. Consistent with this, previous studies in Czech and Spanish samples reported negligible associations between peer support and adolescent psychological outcomes, including emotional regulation [13,17]. Together, these findings suggest that the individualism–collectivism distinction alone does not determine which source of support matters most; rather, peer relationships may serve different functions across cultures [45]. However, these explanations remain tentative, as the present study did not directly measure cultural values, friendship-selection processes, or peer interaction patterns, and the formal between-country difference was not statistically significant after multiple-comparison correction.

Regarding empathy, the country-specific analyses showed that school and peer support were significantly associated with empathy among Slovak adolescents, whereas only peer support showed a significant association among Chinese adolescents. However, formal cross-country comparisons did not reveal significant differences in either association after Holm correction. The positive association between school support and empathy observed in the Slovak sample is consistent with the view that schools represent an important social environment for adolescents' emotional development. Supportive teacher–student relationships and positive school environments may provide opportunities for interpersonal interaction, emotional communication, and perspective-taking, all of which are theoretically relevant to empathy development [21]. Nevertheless, the absence of a significant association in the Chinese sample should not be interpreted as evidence that school support is less important for empathy in China, given that the cross-country difference was not statistically significant.

The consistent relationship between peer support and empathy in the two countries is in line with adolescent developmental characteristics. In puberty, adolescents become increasingly independent and are exposed to more opportunities for peer interactions. Unlike parent- or teacher-adolescent relationships, peer relationships are characterized by greater

equality. The interaction and social observation may provide opportunities for adolescents to observe various prosocial behaviours, including empathy [46]. In addition, during peer interactions, it is common to face challenges, potentially encouraging adolescents to learn to take others' perspectives and share feelings when facing disagreements [47]. Such experiences may be associated with the development of cognitive empathy and corroborates the findings of the significant association between peer relationship and empathy concluded in a multi-level meta-analysis work synthesizing seventy empirical studies [46].

Regarding self-control, the country-specific analyses showed that family and school support were significantly associated with self-control among Slovak adolescents, whereas all three sources of social support showed significant associations among Chinese adolescents. However, formal cross-country comparisons did not reveal significant differences in these structural paths after Holm correction.

The positive association between peer support and self-control observed in the Chinese sample may be understood in the context of adolescent peer socialization. Peer relationships provide opportunities for adolescents to observe and learn behavioural norms, self-discipline, and self-regulatory strategies through everyday social interactions. In the Chinese context, parental involvement in adolescents' friendship choices may also shape peer environments, as parents may encourage friendships with peers who demonstrate desirable academic and behavioural characteristics [43]. Such social contexts may be relevant to the observed association between peer support and self-control, although these potential mechanisms were not directly examined in the present study.

The positive associations of school and family support with self-control have been supported both theoretically and empirically. Support from school and family may be associated with a greater sense of emotional security, self-efficacy, self-worth, and self-control [48]. Moreover, one educational mission of both schools and parents is to teach children to become more self-disciplined. Support from families and schools can also reflect their commitment to implementing this educational mandate.

The observed associations may also be considered within a broader framework of adolescent psychosocial adjustment. Previous research has linked social support and emotional competence with resilience, subjective well-being, and prosocial behaviour [13,14]. Moreover, emotional self-efficacy and self-esteem have been identified as interrelated psychological resources [15]. Although these additional constructs were not directly assessed in the present study, such findings suggest that the relationships between social support and emotional competence may form part of a wider network of interpersonal and psychological resources relevant to adolescent well-being.

These findings also speak to the social dimension of sustainable education. If education systems are to deliver on SDG Target 4.7, socio-emotional learning cannot rely only on families or on adolescents' self-selected peer networks. In the Chinese sample, the corresponding school-support associations were not statistically significant; this does not establish that schools in China are less supportive or less important than those in Slovakia. Reforms such as the 2021 "Double Reduction" policy aim to lighten academic burden [29] and may create space to build social-emotional learning into the curriculum. In the Slovak sample, school support was associated with all three domains of emotional competence; supporting positive school relationships may therefore be worth consideration, without assuming a stronger effect than in China. In both countries, involving families and adding structured peer-support programmes may be worth exploring alongside school-based approaches. Supporting these competencies during adolescence may have implications for long-term mental health, social cohesion and lifelong learning, all of which are preconditions for socially sustainable development. From a sustainable education perspective, the present findings contribute to understanding how perceived support from family, school, and peers

is associated with emotional competencies relevant to adolescent well-being and holistic educational development. These associations are conceptually aligned with SDG 3 (Good Health and Well-being) and SDG 4 (Quality Education), particularly the emphasis on social-emotional development and inclusive learning environments. However, sustainability outcomes, educational practices, and the implementation of social-emotional learning programmes were not directly assessed in this study. Accordingly, the implications for sustainable education should be understood as theoretically informed interpretations rather than demonstrated effects on educational sustainability.

5. Limitations and Implications

Several limitations need to be noted when interpreting the results. First, its cross-sectional design precluded causal inference about the effects of social support on facets of emotional competence. Future studies with a longitudinal design will be needed to examine the stability of the relationship between social support and adolescent emotional competence identified in the study. Second, the samples were drawn from a limited number of schools and may not be representative of the national adolescent populations of Slovakia and China, which limits the generalisability of the findings. Future research should replicate these associations in larger, nationally representative samples from different regions of both countries. An additional methodological limitation concerns the clustered nature of the school-based sampling design. Although participants were recruited from 13 schools in Slovakia and two schools in China, school- and classroom-level identifiers were not retained in the analytical dataset. Consequently, potential within-school or within-classroom dependence could not be assessed or accounted for using multilevel modelling or cluster-adjusted standard errors. Such dependence may affect the precision of the estimated associations and the validity of their statistical inference, particularly for school support. The MLR sensitivity analyses did not address this source of dependence. Future research should retain anonymized school and classroom identifiers and recruit a larger number of schools to enable appropriate multilevel analyses. Third, the study only employed a single method of self-reporting from adolescents, who might provide some social desirability answers. Future research should complement self-reported data with more objective measures and draw participants from teachers or parents in order to triangulate the findings from our study. Fourth, the two samples also differed in their age distributions, with Chinese participants being slightly older on average than Slovak participants (13.38 vs. 12.84 years). Although age and sex were included as covariates in the SEM analyses, these adjustments may not fully account for developmental differences during adolescence. Unmeasured demographic and socioeconomic characteristics may further limit sample comparability and should be considered when interpreting the country-specific findings.

Despite these limitations, the study identified associations between family, school, and peer support and adolescents' emotional competence in the sampled Slovak and Chinese schools. Formal cross-country comparisons did not reveal any structural path differences that remained statistically significant after correction for multiple comparisons. Nevertheless, the estimated association between peer support and emotional regulation was larger in the Chinese sample, suggesting a potentially relevant pattern for future investigation. This finding should be interpreted cautiously because its statistical significance was sensitive to multiple-comparison correction and robust estimation. Cultural values, examination-oriented educational practices, and peer-selection processes may offer possible explanations, but these mechanisms were not directly measured. Furthermore, the limited number of participating schools restricts generalization to national populations and educational systems.

These findings carry several tentative practical implications for educators, parents, and policymakers. Because the design was cross-sectional, these suggestions are based on observed associations rather than evidence that changing support would change emotional competence. In the Chinese context, schools may consider integrating social-emotional learning more explicitly into the academic curriculum. While the academic rigour of the current system is acknowledged, structured programmes addressing emotional regulation, empathy, and self-control could complement academic goals. Teachers could be supported in creating environments that go beyond metrics of academic performance, which may help students navigate emotional and interpersonal challenges.

In the Slovak sample, where school support was associated with all three dimensions of emotional competence, schools may wish to maintain and strengthen emotionally supportive environments. Educators can continue to provide safe, inclusive spaces where students can express themselves, develop empathy, and learn self-regulation through social interactions.

Furthermore, family support was associated with emotional regulation and self-control in both samples, suggesting that parents in both contexts may play an important role in adolescents' emotional competence. In China, parents can be guided to balance academic aspirations with emotional well-being by encouraging emotionally supportive friendships. In Slovakia, parents should be encouraged to maintain open emotional communication and a supportive family climate, which was associated with adolescents' emotional regulation and self-control in this study.

At the school level, several practical strategies may be considered. Structured peer-support activities and collaborative classroom tasks could provide opportunities for students to practice emotional sharing, perspective-taking, and interpersonal self-regulation. Regular teacher–student check-ins and classroom discussions of emotions may help create supportive environments for emotional regulation and empathy. In addition, family–school communication and parent-oriented workshops could encourage consistent emotional support across home and school settings. These strategies are proposed as potential educational applications of the observed associations, rather than interventions whose effectiveness was directly established by the present study.

6. Conclusions

This study explores how different sources of perceived social support—family, school, and peers—relate to adolescent emotional competence across two distinct cultural settings: Slovakia and China. The findings show that family support was associated with emotional regulation and self-control in both countries, but not with empathy. Empathy, in contrast, was associated with peer support in both countries, suggesting that the more egalitarian nature of peer relationships may be particularly important for adolescents' capacity to understand and share others' feelings. Formal cross-country comparisons did not identify statistically significant differences in the nine structural paths after correction for multiple comparisons. Nevertheless, the estimated positive association between peer support and emotional regulation was more pronounced in the Chinese sample, a descriptive pattern that warrants further investigation. These findings suggest that family, school, and peer support are relevant to adolescent emotional competence in both samples, while highlighting the need for further research before drawing conclusions about population-level cultural differences. Schools in both settings may consider ways to support social-emotional learning, with attention to local needs rather than assuming uniform national cultural characteristics. Overall, the study suggests that socially sustainable education requires schools, families and peers to share responsibility for adolescents' emotional development, in ways that respect each country's cultural values and educational traditions.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su182111222/s1, Table S1: Ordinal measurement invariance of the Social Support and Emotional Competence scales across the Slovak and Chinese samples (WLSMV estimation); Table S2: Robust maximum likelihood (MLR) sensitivity analyses of cross-country differences in structural paths between Slovakia and China; Table S3: Country-specific structural paths and uncertainty estimates; Table S4: Internal consistency reliability of six subscales in Slovak and Chinese samples.

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