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Differences in agency? How adolescents from 18 countries perceive and cope with their futures

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Abstract

This study investigated how $N = 5{,}126$ adolescents (mean age of 15 years) from 18 countries perceive and cope with future- and school-related stress. The adolescents completed the Problem Questionnaire (PQ), which assesses stress, and the Coping Across Situations Questionnaire (CASQ), which assesses three coping styles (reflection/support-seeking, emotional outlet, and withdrawal/denial). Across countries, adolescents reported considerably higher levels of future-related stress than school-related stress. The adolescents actively coped with stressors in both domains and seldom relied on emotional outlet or withdrawal/denial. A clustering of the countries according to socioeconomic criteria and geographical proximity demonstrated that adolescents from the *continental* group of countries showed low stress and high coping. Adolescents in the *east/Asia* group showed medium stress and low coping and those in the *south* group showed high stress and low coping. Developmental context was more strongly associated with stress perception and coping, style than age or gender, a finding relevant for prevention approaches aiming to endorse positive orientation to the future and improve coping competence.

Keywords

academic stress, coping, cross-cultural study, fearful future anticipations

> Happy: I think if you just got started—I mean—is there any future for you out there?
>
> Biff: I tell ya, Hap, I don't know what the future is. I don't know what I'm supposed to want.
>
> Mom: Are you here to stay now?
>
> Biff: I don't know. I want to look around, see what's doing.
>
> Mom: Biff, you can't look around all your life, can you?
>
> Biff: I just can't take hold Mom. I can't take hold of some kind of life.
>
> *Death of a Salesman* (Arthur Miller, 1949/1986)

Being apprehensive about the future is not a new phenomenon during the transition to adulthood, and adolescents are typically worried about failing in school or being unable to find employment (Gillies, 1989). Compared to earlier decades, current life conditions for adolescents in most Western, industrialized countries are characterized by extended years of schooling and new career options, but also by greater uncertainty in career planning (Arnett, 2002; Furlong & Cartmel, 1997). Adolescents in other parts of the world may be experiencing political unrest, and although many have more freedom to personally choose their future vocations, they may be confronted with new kinds of job opportunities or limitations (Larson, 2011). Although such societal changes may be perceived as challenges in the positive sense, they may also promote anxieties about the future. Young people may become more worried about their educational progress, because success in school largely determines their professional outcomes. This study therefore set out to

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examine what kinds of future- and school-related stressors are salient for adolescents from different regions of the world today and to analyze how adolescents cope with these stressors.

Future- and school-related stress and coping

Successful transition to adulthood calls for the abilities to anticipate future challenges and adapt to stressful events in the school context. Rapid social and technological changes, the increasing plurality of norms and values, and a growing structural uncertainty at the societal level have made this adaptational process more difficult. For decades, typical fearful anticipations for adolescents have included worries about becoming unemployed or not finding the right profession (Nurmi, 1991; Nurmi, Poole, & Seginer, 1995; Seiffge-Krenke, 1995; Soltanaus, 1987). More recent research has shown that adolescents, especially those from European countries, have much higher rates of future-related stressors (Gelhaar et al., 2007; Nurmi, 2005) than they did in the 1990s. Fears and worries about one's personal future (e.g., becoming unemployed, not getting the job one wants) are coupled with school-related stress. In many countries, adolescents have become increasingly concerned about achieving good grades and being admitted to higher educational programs (Gelhaar et al., 2007; McAndrew, Akande, Turner, & Sharma, 1998).

How adolescents cope with these stressors has an extremely important bearing on whether they successfully make the transition to adulthood and assume relevant roles and responsibilities (Arnett, 2002). Cultural norms and prevailing values for social interaction may also have a bearing on which kinds of coping behaviors are used to deal with stress. Research on adolescent samples in the United States (US), Canada, and Europe has described a variety of coping strategies that are exhibited when dealing with stress (Compas, Connor-Smith, Saltzman, Harding Thomsen, & Wadsworth, 2001; Seiffge-Krenke, 1995; Skinner, Edge, Altman, & Sherwood, 2003). These include active or approach-oriented strategies (e.g., negotiating, seeking support, or discussing the problem with concerned others), but also reflection (e.g., thinking about the problem and weighing different solutions). Further strategies pertain to the control of emotions aroused by the stressful situation (e.g., emotion regulation or emotional outlet), or strategies including withdrawal from the stressful situation. However, it is unclear whether the frequent use of negotiation or support-seeking to deal with stress, which appears to be normative in Western cultures (Seiffge-Krenke, 2011; Seiffge-Krenke, Aunola, & Nurmi, 2009), also applies to adolescents in non-Western cultures. In Western countries, female adolescents generally report higher levels of stress than males, whereas males report more school-related stressors than females (Compas et al., 2001; Seiffge-Krenke et al., 2009). Further, females seek social support to cope with stress more often than males do, whereas males are more likely to engage in denial or seek distraction (Compas et al., 2001; Tamres, Janicki, & Helgeson, 2002). Regarding age effects, future- and school-related stressors are most salient during mid- and late adolescence (Malmberg & Trempala, 1997; Nurmi, 2005). Improved cognitive abilities and social skills acquired during adolescence have been found to be accompanied by an increased use of adaptive coping strategies in older adolescents (Compas et al., 2001; Seiffge-Krenke et al., 2009).

Placing stress and coping in a broader societal and cultural context

Although work on coping with stress during adolescence has substantially expanded in recent years, little research has focused on how different contexts influence stress perception and coping style. The model of social change and human development (Pinquart & Silbereisen, 2004; Schoon & Silbereisen, 2010) and the life-span theory of control (Heckhausen, Wrosch, & Schulz, 2010) served as frameworks for this study. The fundamental tenets and concepts underlying these theories emphasize the individual's agency in dealing with social changes. Coping with social change is viewed as an active process. More specifically, the theories suggest that coping with demands of social change is a function of how individuals appraise these demands and what resources they can use to deal with them. As such, differences in the ways adolescents around the world cope with school- and future-related stress may be related to country- or region-specific differences in how social changes are appraised and what resources are available to deal with them.

There are many indications that the developmental context for adolescents in Western and non-Western societies has been changing over the past decades (Arnett, 2002; Larson, 2011). Young people in the West are often encouraged to attain higher levels of education and obtain more professional qualifications, even though these may not necessarily guarantee job security (Arnett, 2000; Blossfeld, Klijzing, Mills, & Kurz, 2005). A substantial proportion of adolescents in these societies go through a period of broad exploration of various career options without committing themselves to certain professional goals (Côté, 2002). Taken together, social changes in Western societies have encouraged young people to obtain higher levels of education and explore different professional areas. However, the changing opportunity structures may contribute to high levels of school-related stress and worries about the future.

It remains unknown whether any of the reported findings on coping with future- and school-related stress are also relevant for youths in non-Western societies. In this regard, it is important to note that it is commonly accepted that adolescents from Western societies grow up in cultures which stress individual achievement (Blossfeld et al., 2005). In addition, these adolescents' future orientations are generally based on the assumptions of being free to explore different career training options without parental interference and, often, on being able to receive financial support from the government. In contrast, opportunity structures related to education and work may be different in other cultures, and the impact of the family in the process of career development may be different. For example, adolescents from Middle Eastern or Asian countries tend to be integrated into strongly cohesive families, and their future-related options (e.g., finishing their schooling or finding a job) are often defined in terms of connectedness to and dependence on the family (Fuligni, 2007; Hardway & Fuligni, 2006). In such cultures, adolescents often must respect their family's suggestions about their educational and professional goals. Findings from recent studies (Chen, Bian, Xin, Wang, & Silbereisen, 2010; Kağıtçıbaşı, 2005), however, suggest that parents are becoming more willing to grant their children more autonomy, including allowing them freedom to choose a vocation. In addition, social change may create demands (such as longer education, more career options), but also risks (such as lack of access to schools, job loss, insecurity in career planning) for youths in non-Western countries (Tomasik, Silbereisen, & Pinquart, 2010), both of which may have an impact on how youths in these countries perceive everyday stress in the domains of school and the future.

Cultural norms also affect which kinds of behaviors may be used to cope with stress in the domains of school and future. Although the use of active, approach-oriented coping strategies is highly normative in Western countries (Compas et al., 2001; Seiffge-Krenke et al., 2009; Skinner & Zimmer-Gembeck, 2007), this may not be the case in non-Western countries. In addition, not all cultures approve of negotiating as a means for solving conflicts about education and career plans (Nelson & Chen, 2007). In cultures which value harmony with and interdependence in the family and with friends (e.g., as found in most countries of the majority world; Oyserman, Coon, & Kemmelmeier, 2002), withdrawal coping strategies may be preferred and emotional control may be high. Thus, respect for traditional family values, closer family ties, and family-oriented support systems may strongly influence how youths in many non-Western countries who are growing up in changing developmental contexts perceive and cope with school- and future-related stressors. Further, gender-specific behaviors and gender role stereotypes vary across cultures and may limit the options of using certain coping strategies. A final consideration is that culture-specific gendered behaviors and gender role stereotypes, which may limit educational and professional choices and ways of dealing with school- and future-related stress, are more firmly entrenched in non-Western cultures.

Research questions and hypotheses

To summarize, although stress and coping during adolescence have been extensively investigated, few studies have examined culturally-related differences from a broader perspective. Previous cross-cultural research primarily focused on conducting bi-national comparisons of adolescent samples, mostly from countries which share common borders (Brouwers, van Helmert, Breugelmans, & van de Vijver, 2004). Many studies used inadequate sampling methods that generated high variations in sample sizes (e.g., Rescorla et al., 2007) or levels of schooling (e.g., Jose et al., 1998; Malmberg & Trempala, 1997). Given the increase in future- and school-related stressors experienced by adolescents in Western countries, an investigation of stress perception and coping with stress in adolescents from different parts of the globe, using careful sampling procedures, is clearly warranted.

This study is part of a cross-cultural research project on adolescents' stress and coping in 25 countries. We started by analyzing country-level differences (Gelhaar et al., 2007) and intra-country versus cross-country differences (Haid et al., 2010; Seiffge-Krenke et al., 2010) for several European countries and found, despite distinctive patterns and variations within each country, impressive similarities in stress perception and coping styles among adolescents from different European countries such as Finland, France, Germany, Great Britain, Greece, Italy, and Portugal. These findings, together with the lack of research on adolescents in the majority world (Arnett, 2008) and the structural uncertainty at the societal level in many countries of the world, prompted us to include samples from other regions of the world. Therefore, in this study we analyzed how adolescents from 18 different countries perceived stress arising in the domains of future and school, and how they coped with this stress. At this step in the process of our cross-cultural research, we were particularly interested in making macro-level comparisons in order, for example, to establish region-dependent differences. The main aims of the study were as follows:

- We wanted to test the hypothesis that the developmental context shapes stress perception and coping style. Based on a grouping of countries according to geographical proximity and key socio-economic indicators, we expected that adolescents from European and North American countries would show overall lower stress levels than would adolescents from other parts of the world, for example, Asia, South America, and the East. This expectation was founded on studies showing that youths in Western industrialized countries generally have better opportunity structures in the work sphere and receive greater support for individual choices (Tomasik, Silbereisen, & Heckhausen, 2010). Regarding coping, we expected that adolescents from the Southern regions or Asia, who are thought to be more family-oriented and dependent on their family networks, would use more support-seeking to cope with stress than would adolescents in Western industrialized countries that endorse individual autonomy (Kağıtçıbaşı, 2005). Although noticeable changes with respect to the main socialization goals in Asian families have been reported (Chen et al., 2010), we expected that Asian adolescents would not negotiate or openly express their individual desires as much as their age-mates in Western regions. We therefore expected that withdrawal coping styles would more likely be found in adolescents from Asian or southern countries in which interpersonal harmony is important.
- We also wanted to examine the effects of age and gender on adolescents' stress perceptions and coping styles in future and school domains. Based on earlier research (Compas et al., 2001; Nurmi, 2005; Seiffge-Krenke et al., 2009; Tamres et al., 2002), we expected that females in all countries would report higher stress levels in both domains than males would, and that older adolescents would experience higher stress levels than younger adolescents, particularly in the future domain. In addition, we expected that females would use more support-seeking strategies than males would, and that males would use more withdrawal strategies than females.

Method

Participants

Data were initially collected from a sample of 11,035 adolescents from 18 countries (Costa Rica, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Great Britain, Hong Kong, Italy, Korea, Pakistan, Peru, Poland, Russia, Spain, Turkey, and the United States). In order to balance the samples with respect to size, gender, and age distribution, we defined an ideal reference sample with a balanced gender ratio and age structure that reflected the average age distribution across all participants. Standardized samples of size $n = 300$ were then compiled for each country, employing an iterative Monte-Carlo procedure on the full dataset to most closely approximate the gender and age distributions of the reference sample. Due to limitations of the original samples, three countries contributed less than the required $n = 300$ to the sample (Croatia, $n = 224$; Pakistan, $n = 244$; and Poland, $n = 258$). All analyses reported here were based on the standardized samples, with a total of $N = 5{,}126$ adolescents. Table 1 provides an overview of the sample's demographics according to country. Mean age and age variance were reasonably well balanced among the samples ($M_{age} = 15.12$ years, $SD = 1.76$). The gender ratio was perfectly balanced for all but three countries. The majority of adolescents lived in middle- or upper-class households (72.6%), and they were all high school students. There were, however, pronounced

Table 1. Demographic characteristics and socioeconomic indicators for 18 countries

		Age[1]			No. of siblings[1]		Socioeconomic class[1] (%)					
	Region	Mean	*SD*	Two-parent families[1] (%)	Mean	*SD*	Upper	Middle	Lower	Unemployment rate[2] (%)	GDP[3] per capita ($)	Birth rate[2] (per 1,000 people/year)
Costa Rica	South	16.94	0.89	—	—	—	1.0	87.9	11.1	10.7	11.6	17.43
Croatia	East	15.04	2.30	81.7	0.99	0.93	11.3	81.1	7.6	24.0	18.4	9.64
Czech Rep.	East	15.15	1.80	—	—	—	31.1	67.2	1.7	10.7	25.9	8.83
Estonia	East	14.81	1.61	68.6	1.04	1.01	—	—	—	10.0	21.4	10.37
Finland	Continental	16.56	1.04	69.2	—	—	28.1	69.2	2.7	15.7	37.0	10.38
France	South	13.62	0.90	70.2	1.95	1.42	16.2	60.3	23.5	18.7	33.3	12.57
Germany	Continental	15.10	1.63	66.3	1.54	1.38	58.8	21.9	19.3	11.7	35.5	8.18
Great Britain	Continental	14.72	1.41	74.5	2.04	1.59	—	—	—	14.4	36.7	10.65
Hong Kong	East	14.80	1.56	87.0	1.93	1.29	—	—	—	—	—	—
Italy	South	15.34	1.78	84.2	1.28	0.96	21.4	60.2	18.4	20.3	31.4	8.18
Korea	East	15.29	1.49	92.3	2.21	0.66	10.3	79.0	10.7	8.9	27.7	8.93
Pakistan	South	15.21	2.47	98.8	4.20	1.63	15.1	65.4	19.5	7.5	2.5	27.62
Peru	South	16.70	1.07	—	—	—	—	—	—	14.3	8.5	19.38
Poland	East	15.03	1.99	80.5	1.11	0.87	56.4	39.8	3.7	21.7	17.4	10.04
Russia	East	14.73	1.55	73.2	0.84	0.66	—	—	—	14.5	16.1	11.1
Spain	South	15.54	1.26	—	—	—	—	—	—	18.2	34.6	9.72
Turkey	South	15.06	1.64	92.3	1.88	1.35	67.7	30.1	2.3	19.6	11.9	18.66
USA	Continental	14.68	2.06	88.0	1.10	0.63	13.5	82.5	4.0	10.5	47.5	13.82

Notes. [1]Data are taken from self-reported demographic measures; [2]Data compiled from the World Bank Data Catalogue (2009); [3]Data compiled from the Central Intelligence Agency Factbook (2009).

differences in family structure and size across regions, as can be seen in Table 1.

As many cultural and economic similarities may exist across national boundaries, it is useful to aggregate countries. We therefore collapsed the 18 countries into three regions based on geographic location (i.e., Western Europe and North America, Eastern Europe and Asia, and southern countries). The *continental* group comprised Germany, England, Finland, and the US. The *East/Asian* group included Croatia, the Czech Republic, Estonia, Poland, Russia, Hong Kong, and Korea. The *South* group included Costa Rica, France, Italy, Pakistan, Peru, Spain, and Turkey. We validated the clustering by geographic proximity, which is thought to serve as a proxy for common social, political, and economic environments, by conducting a discriminant function analysis (DFA) on key socioeconomic indicators (as described by Hofstede & Bond, 1988). Among the predictor variables were two of the main moderators of adolescent stress: national economic situation, as assessed by gross domestic product (GDP) per capita, and the youth unemployment rate. Moreover, we added birth rate and the proportion of adolescents in the total population to the predictors. An overview of three of the four predictor variables is provided in Table 1. The DFA was then conducted to reproduce our geographic clustering based on the four predictor variables. Results were highly significant, Wilk's $\lambda = .159$, $df = 8$, $p = .003$, with just one misclassified country, thus corroborating our formation of regions from the pool of countries we selected.

Instruments

Future- and school-related stress. Adolescent stress was measured by the Problem Questionnaire (PQ; Seiffge-Krenke, 1995), which assesses the perceptions of 64 minor stressors in various domains. Participants are asked to rate the stressfulness of specific events, ranging from 1 (*not stressful at all*) to 5 (*highly stressful*). A confirmatory factor analysis on the present sample confirmed the following seven stress domains in everyday life: problems at school; problems with future issues; problems with parents; problems with peers; problems during leisure time; self-related problems; and problems related to romantic relationships. The variance explained was 67.44%, which replicated earlier factor structures established for other samples (Seiffge-Krenke, 1995). In the present study, we used the items pertaining to the two problem domains of school (seven items; e.g., "There is great pressure to get the best marks in school," "Learning material is too difficult for me," $\alpha = .81$) and the future (eight items; e.g., "I might become unemployed," "I am confused about what to do after leaving school," $\alpha = .84$).

We should draw attention to the fact that the two scales for assessing stressors in the school and future domains contain different items. Due to variations in item difficulty, floor and ceiling effects can reduce inter-scale comparability. Thus direct comparisons between mean values for levels of perceived stress in these respective domains must be made cautiously. Nonetheless, the mean scores represent reasonable approximations of adolescents' stress perceptions in the future and school domains.

Coping with future- and school-related stress. Coping behavior was measured by the Coping Across Situations Questionnaire (CASQ; Seiffge-Krenke, 1995), which assesses 20 coping strategies across eight problem domains: school, teachers, future, parents, peers, leisure time, self, and romantic relationships. For this study we selected the domains of school and future to complement the corresponding domains of perceived stress. The participants were required to mark all coping strategies they regularly used when a stressor in the respective domain occurred. Confirmatory factor analysis on the present sample revealed the following three different coping styles (variance explained 66.89%). The first style, termed *reflection/support-seeking*, encompassed coping strategies such as "I think about the problem and try to find different solutions," "I discuss the problem with my parents," "I try to solve

Table 2. Results from measurement invariance analysis for the PQ and the CASQ

	Model fit for the PQ				Model fit for the CASQ			
Model	$\chi^2_{(df)}$	RMSEA	CFI/IFI	TLI	$\chi^2_{(df)}$	RMSEA	CFI/IFI	TLI
Unconstrained	$908.654_{(144)}$	0.049	0.979	0.972	$2280.517_{(282)}$	0.054	0.911	0.933
Factorial invariance	$1001.877_{(160)}$	0.048	0.977	0.972	$2412.266_{(293)}$	0.057	0.904	0.927
Metric invariance	$1394.857_{(184)}$	0.054	0.967	0.965	$2619.186_{(304)}$	0.062	0.896	0.923

Note. Summarized are χ^2 and degrees of freedom for the tested model, the root mean square error of approximation (RMSEA), the comparative fit index (CFI) and incremental fit index (IFI), and the Tucker-Lewis Index (TLI). A probit model was used for the CASQ due to the dichotomous response scheme.

the problem with the help of my friends" (eight items, $\alpha = .85$). The second style, termed *emotional outlet*, comprised strategies such as "I let out my anger or desperation by shouting, crying, slamming doors," or "I try to let out my aggression (with loud music, riding my motorbike, wild dancing, sport, etc." (four items, $\alpha = .81$). The third style, termed *withdrawal/denial*, included items such as "I withdraw because I cannot change anything anyway," and "I try not to think about the problem" (five items, $\alpha = .81$). Due to the dichotomous response scheme, possible scale means in the CASQ range from 0.0 (indicates that none of the coping strategies constituting the scales are used) to 1.0 (indicates that all coping strategies are used).

Control variables. A demographic survey assessed possible covariates and effect variables such as gender, age, socioeconomic status (SES), family structure, and family size. All variables were measured by self-assessment. The control variables were utilized in compiling the standardized samples for each country, as described earlier. Moreover, gender and categorized age were included as between-subjects factors in the conducted analysis of variance (ANOVA) routines.

Measurement invariance. We conducted a measurement invariance analysis prior to our original analyses to ascertain whether our instruments measured the same constructs on comparable scales across regions. Measurement invariance was tested on participant level data for both the PQ and the CASQ in a procedure adopted from Widaman and Reise (1997), with the three regions serving as grouping units. Since our main goal was to compare mean scores among regions, we checked (1) configural invariance; (2) factor loading invariance; and (3) intercept invariance. Results from (2) and (3) for the PQ as well as CASQ are summarized in Table 2. Considering our rather large sample size, we followed Cheung and Rensvold's (2002) suggestion to assume measurement invariance if the comparative fit index (CFI) does not change by more than 0.01 units between increasingly constrained models. The analysis showed that the null hypothesis of measuring the same construct on identical scales cannot be rejected for the PQ and the CASQ, thus validating our elaborate translation process.

Procedure

In order to ensure cross-cultural validity and equivalence, senior and junior researchers and collaborators from all 18 countries attended regular meetings during which the items of the PQ and CASQ were translated into the official language of each country and then translated back into English. In addition, the item content was checked for cross-cultural usefulness and applicability for each country. Discrepancies between the different versions were reconciled in a stepwise process before the instruments were finally applied. In all countries the assessments were conducted in high schools in university cities, in order to reduce variance caused by differences in school levels and urbanization. Ninety-four percent of the parents submitted written consent for their child's participation in the study. All assessments were predominantly conducted in whole class levels; the overall dropout rate was very low (3%). During a classroom period, each participant received a questionnaire and survey packet (coded to guarantee participant's anonymity) containing the PQ, the CASQ, and the demographic survey. The native language-speaking cooperation partner and his or her research assistant remained in the classroom for the duration of the assessment to answer questions.

Plan of analyses

A mixed, three-way, repeated measures ANOVA (RM-ANOVA) tested the effects of gender and age as between-subject factors on levels of perceived stress in the two stressor domains (future- and school-related stress). A mixed, four-way RM-ANOVA then explored the effects of the between-subject factors gender and age on three different coping styles (reflection/support-seeking, emotional outlet, and withdrawal/denial) for the stressor domains of school and future. Age as a between-subjects factor comprised three levels, into which adolescents were grouped: young adolescents (age 12–14 years), mid-adolescents (age 15–16 years), and old adolescents (age 17–19 years). Analyses were conducted on the mean responses for each country. Differences between factor level means were tested by post-hoc Fisher least significance (LSD) tests. We converted these raw differences between means into an effect size measure by dividing the difference between two means by the observed standard deviation of country level means. The resulting statistic represents a standardized mean difference which approximately follows a t distribution. For ease of interpretation, we applied a quantile transformation to these effect sizes to convert them into simple z scores, which conveniently characterize the magnitude of the differences between two means. In the following, we report on effect size measures using z scores (all conventions for z scores apply). Finally, we conducted a discriminant analysis to translate the regional clustering of countries based on geographic and socioeconomic predictors (see methods section) into common stress and coping patterns among countries.

Results

Effects of problem domain, gender, and age on perceived stress and coping style

Table 3(I) provides an overview of factor level means and standard deviations for perceived stress, as assessed by the PQ. An

Table 3. Means and standard deviations of stress levels and coping styles

Age	12–14 years		15–16 years		17–19 years	
Gender	Male	Female	Male	Female	Male	Female
(I) PQ: stress level						
School	2.455 (.793)	2.513 (.804)	2.504 (.743)	2.589 (.752)	2.502 (.732)	2.546 (.716)
Future	2.774 (.836)	3.061 (.854)	2.836 (.808)	3.094 (.834)	2.861 (.815)	3.076 (.812)
(IIa) CASQ: reflection/support-seeking						
School	0.359 (.300)	0.39 (.306)	0.387 (.305)	0.444 (.313)	0.362 (.295)	0.439 (.324)
Future	0.235 (.271)	0.231 (.270)	0.235 (.264)	0.266 (.276)	0.227 (.270)	0.301 (.297)
(IIb) CASQ: emotional outlet						
School	0.259 (.341)	0.259 (.351)	0.288 (.331)	0.314 (.357)	0.218 (.312)	0.295 (.355)
Future	0.163 (.298)	0.127 (.264)	0.149 (.275)	0.145 (.287)	0.126 (.256)	0.155 (.289)
(IIc) CASQ: withdrawal/denial						
School	0.275 (.291)	0.277 (.296)	0.247 (.294)	0.226 (.284)	0.218 (.265)	0.215 (.284)
Future	0.185 (.269)	0.163 (.260)	0.158 (.249)	0.152 (.237)	0.146 (.229)	0.144 (.228)

Note. PQ values range between 1 (lowest possible perceived stress level) and 5 (highest possible perceived stress level). CASQ values vary between 0 (coping style not used) and 1 (coping style extensively used).

Table 4. Results of RM-ANOVA for levels of stress and coping styles

	(I) Level of stress (PQ)					(II) Coping style (CASQ)				
Factor	Var	*df*	*F*	*p*	η^2	Var	*df*	*F*	*p*	η^2
Gender	1.156	1	14.110	.000	.122	.071	1	2.572	.112	.025
Age	.325	2	3.970	.022	.072	.014	2	.496	.610	.010
Gender × age	.044	2	.540	.586	.010	.009	2	.317	.729	.006
Error	.082	102				.027	102	.000	.000	.000
Domain	8.601	1	294.660	.000	.743	2.003	1	486.821	.000	.827
Domain × gender	.417	1	14.290	.000	.123	.014	1	3.518	.094	.033
Domain × age	.033	2	1.120	.332	.021	.011	2	2.611	.122	.049
Domain × gender × age	.019	2	.650	.525	.013	.000	2	.000	1.000	.000
Error	.029	102				.004	102	.000	.000	.000
Style						1.084	2	164.081	.000	.617
Style × gender						.038	2	5.729	.011	.053
Style × age						.027	4	4.080	.012	.074
Style × gender × age						.001	4	.200	.955	.004
Error						.007	204	.000	.000	.000
Domain × style						.053	2	30.738	.000	.232
Domain × style × gender						.014	2	8.071	.002	.073
Domain × style × age						.003	4	1.446	.333	.028
Domain × style × gender × age						.000	4	.118	.983	.002
Error						.002	204	.000	.000	.000

Note. Var = estimated population variances, *df* = degrees of freedom, *F* = *F* statistic, *p* = significance level, and η^2 = proportion of variance explained for each independent and repeated measurements factor. Where appropriate, *df* were Huynh-Feldt corrected before computing *p*-values.

RM-ANOVA was conducted for stress levels in the domains of school and future as the dependent variable, with gender and age as independent predictors. Results are summarized in Table 4(I). Significant effects are illustrated in Figure 1, which also provides statistics for all pairwise Fisher least significant difference (LSD) post-hoc comparisons between groups. A Huynh-Feldt correction (see Lecoutre, 1991) was applied to the degrees of freedom to correct for bias in the *F* statistic resulting from any sphericity violations. Both gender and age exerted significant main effects on overall perceived stress levels: Female participants experienced higher stress levels than males (Figure 1a), and stress increased with age (Figure 1b). A strong main effect also emerged for the two domains of stress. Adolescents found future-related problems to be significantly more stressful than school-related ones (Figure 1c). The significant interaction between gender and stress domain suggests that, although females and males reported similar levels of school-related stress, females reported significantly higher stress levels concerning future-related problems than males did. Standardized mean differences (*z*) for the significant differences were moderate to high.

An overview of factor level means and standard deviations for the use of different coping styles, as assessed by the CASQ, is provided in Table 3(IIa–c). The adolescents' use of three coping styles (reflection/support-seeking, emotional outlet, and withdrawal/denial) in response to future- and school-related stressors was tested by an RM-ANOVA, with region and gender serving as independent variables. Results are summarized in Table 4(II).

Figure 2 illustrates the significant main and interaction effects and presents statistics for all significant, pairwise, Fisher LSD

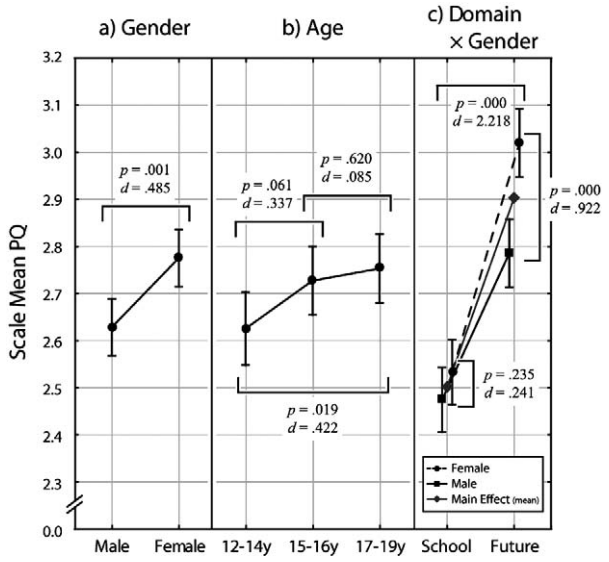

Figure 1. Significant main and interaction effects of gender (a), age (b), and stress domain (c) on perceived stress. Depicted are factor level means together with their 95% confidence intervals. Fisher LSD *p* values and standardized mean differences *z* are provided.

post-hoc comparisons between groups. Coping behavior was generally unaffected by gender or age. A highly significant main effect, with a substantial standardized mean difference of $z = 1.616$, emerged for the measured levels of stress. Adolescents exhibited higher levels of coping efforts to deal with school-related stress than for future-related stress (Figure 2a). In addition, a significant main effect was found for coping style (Figure 2b). Adolescents used reflection/support-seeking strategies most frequently and seldom relied on emotional outlet or withdrawal behaviors. Standardized mean differences (z) were moderate to large for pairwise comparisons of reflection/support-seeking with emotional outlet and withdrawal/denial, respectively. The significant interaction between coping style and gender (Figure 2b) was almost entirely rooted among female adolescents, who exhibited significantly more reflection/support-seeking behaviors than males did. It is noteworthy that, although females reported having greater future-related stress than males did (see Figure 1), we found no interaction between gender and coping style, which rules out the possibility that a gender-specific deficit in coping with future-related stress was responsible for the females' higher stress levels. Further, we found a significant interaction between coping style and age (Figure 2c). Older adolescents used reflection/support-seeking strategies more often and, conversely, emotionally expressive coping strategies or withdrawal/denial behaviors less frequently than younger adolescents did. The significant interaction between coping style and stressor domain (Figure 2d) ensued from the fact that the diminished use of coping strategies in the future domain compared to the school domain is most pronounced for reflection/support-seeking and emotionally expressive behaviors. Standardized mean differences (z) for the differences between school- and future-related coping styles were about two times greater for reflection/support-seeking than for withdrawal/denial and emotional outlet, respectively. Finally, a significant third order interaction between coping style, stress domain, and gender (Figure 2d) emerged. This was due to the fact that, in dealing with school-related stress, female adolescents engaged in more reflection/support-seeking than males did.

A comparison of the main effects between stress level and coping style in the school and future stressor domains revealed a striking pattern (see Figure 3). Levels of stress experienced in the future domain tended to be significantly higher than for those experienced in the school domain, with a large standardized mean difference of about $z = 2.22$ (Figure 3a). For all three coping styles, however, adolescents reported less coping behavior in dealing with future-related stressors than with school-related stressors (Figure 3b–c).

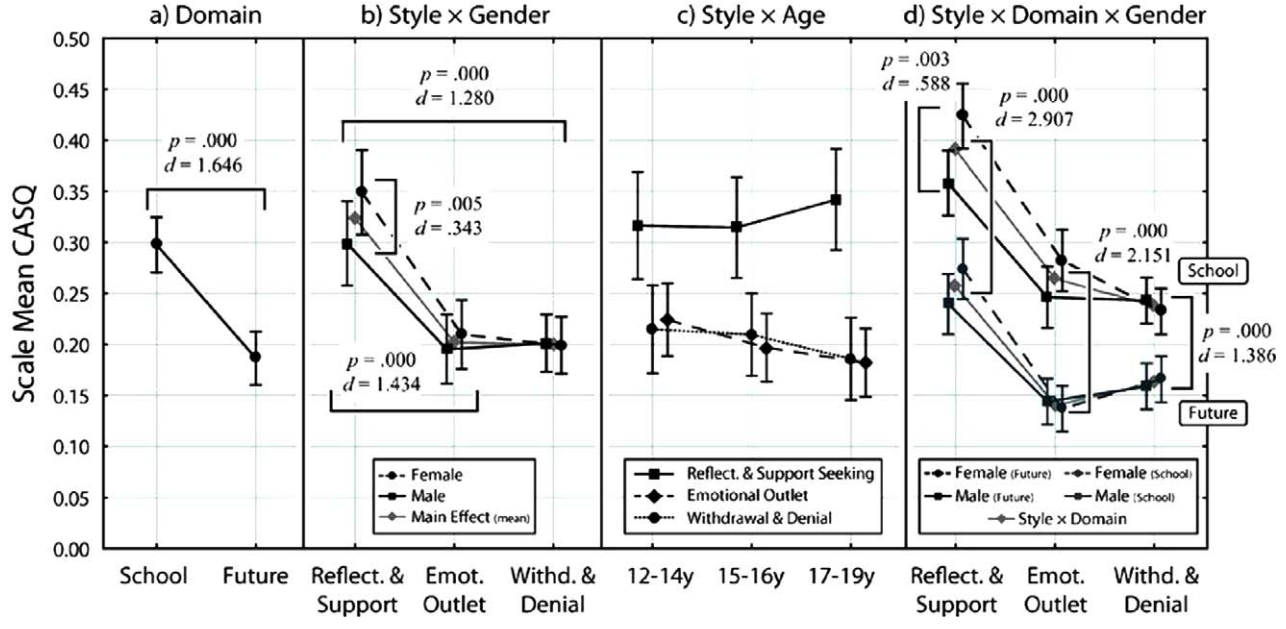

Figure 2. Main and interaction effects of gender, age group, stressor domain, and coping style on coping behavior. Fisher LSD *p* values and standardized mean differences *z* are provided only for significant differences.

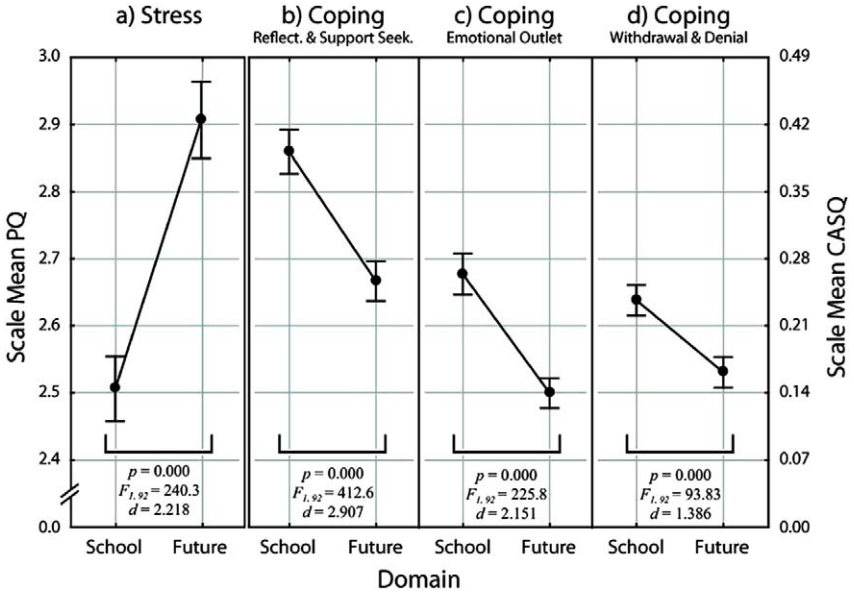

Figure 3. Comparison of stress level (a) and the use of three different coping styles (b–d) in the stressor domains school and future. Depicted are factor level means across all age groups and both genders, together with their 95% confidence intervals and standardized mean differences z.

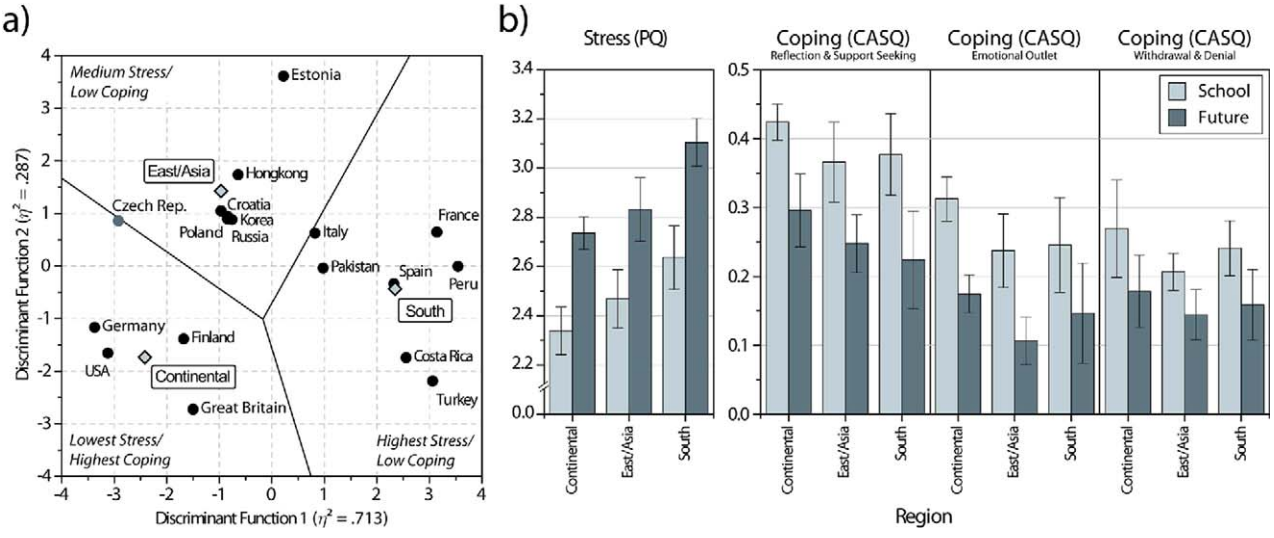

Figure 4. Discriminant function analysis results obtained on all countries for the three aggregate stress and coping variables. The left panel a) depicts the set of countries (black dots) in the coordinate space spanned by the two discriminant functions, together with the resulting territorial map of the three country groups (dark grey solid lines) and their group centroids (diamonds). The one misclassification (i.e., the Czech Republic) is marked by a grey dot. The right panel (b) shows means and confidence intervals for the stress and coping variables.

Common patterns of stress and coping behavior in different geographic regions

One of the main objectives of our study was to obtain evidence to support the notion that adolescents' stress levels and coping styles exhibit region-specific patterns. We first assigned participating adolescents' countries to one of three larger geographical regions and validated geographic clustering by conducting a discriminant function analysis (DFA) on a number of key socioeconomic indicators (see Method section). In order to verify this clustering, we finally conducted a second DFA on the stress and coping variables in the school and future domains. A graphic representation of the DFA solution is provided in Figure 4. We used the stress and coping variables as independent variables to reproduce membership of countries according to our predefined regions. Classification of countries into the three regions resulted in only one misclassfication, Wilk's $\lambda = .063$, $df = 16$, $p = .011$. The territorial map in Figure 4a illustrates the clear separation of countries with their respective group centroids between the three regions. Our initial geographic clustering of countries into regions was thus validated by two vastly different DFAs, one based on key socioeconomic indicators, the other on the stress and coping variables.

A closer inspection of the magnitudes of adolescents' stress levels and their use of coping behaviors within the three regions reveals a systematic pattern (Figure 4b). Adolescents in the continental group had the lowest levels of perceived stress and the highest levels of coping activities. Adolescents from the East/Asian region experienced notably more stress but reported the lowest levels of coping behaviors. Despite slightly more pronounced coping efforts, adolescents from the South group reported the highest stress levels of all. Standardized mean differences (z) were particularly large for the differences in stress levels between the countries.

Discussion

Current research on stress and coping in adolescence is significantly limited by that fact that most studies have been based on samples living in predominantly Western, industrialized countries. Our study, which was grounded on theories of human development in times of social change (Heckhausen et al., 2010; Pinquart & Silbereisen, 2004), demonstrated that youths from 18 countries were remarkably active and competent in dealing with everyday stressors in the domains of future and school.

Adolescents' apprehensions about the future around the world

Adolescents in different countries around the world must adjust to and cope with the changing opportunities and constraints in their current and future lives. Rather than comparing adolescents from single countries, we explored how adolescents from several regions, with different vocational and career patterns, welfare systems, and family obligations, come to terms with everyday stress in the domains of school and future. A discriminant analysis based on the selection of standardized samples of adolescents from 18 countries suggested that three regional groups could be formed, which differed with respect to the home country's geographical proximity and diverse socioeconomic indicators. Adolescents in the continental group (comprising northern and western European countries, such as Germany, Finland, and the US) shared the developmental context of growing up in an industrialized nation in which individual choice of career is endorsed and personal achievement is highly regarded. Adolescents in the East/Asian group were growing up in countries that had been markedly influenced by increased industrialization, societal upheaval, and changes in traditional values. This was particularly true for adolescents living in countries formerly under communist rule (e.g., Croatia, the Czech Republic, Estonia, Poland, and Russia) or in those undergoing an enormous increase in industrialization (e.g., Hong Kong and Korea). Although new opportunities might have become available to these adolescents, previous forms of care and support cultures might have been entirely dissolved (Côté, 2002). Finally, adolescents in the South group were growing up in countries with lower levels of industrialization, lower GDPs, larger families, and lower SES levels (e.g., Costa Rica, Peru, Pakistan, and Turkey). However, this group also included Southern European countries (e.g., France, Italy, and Spain) where sociocultural norms strongly uphold family-oriented values.

In all countries and all regions, adolescents reported that they experienced substantially higher levels of future-related stress than school-related stress. This suggests that, despite changing living conditions and regional differences in demands and opportunity structures (Nurmi, 2005; Tomasik, Silbereisen, & Pinquart, 2010), all adolescents in our study were concerned with apprehensions about their futures. The basic ranking of stressfulness was quite similar across regions. Most adolescents assigned a high rank of 1 or 2 to the stressor that they might not be able to pursue the vocational training or academic studies of their choice. The majority assigned a medium rank of 3 or 4 to the fear of becoming unemployed and a low rank of 7 or 8 to the potential difficulty of combining studies or employment with marriage and family. However, despite these overall similar rankings, stress levels were substantially higher for adolescents in the South group than in the continental and East/Asian groups. Although the economic conditions in the various countries in the South group were quite different, it is possible that the emphasis on family obligations in these countries was greater (Hardway & Fuligni, 2006). It can be speculated that the adolescents in the South group were already feeling the pressure to find a good job so that they could meet these expectations (Douglass, 2007; Galambos & Martínez, 2007). In addition, because financial independence is a prerequisite for autonomy from parents in most Southern European countries (Cherlin, Scabini, & Rossi, 1997), these adolescents might have been very concerned with preparing themselves for future employment. The high youth unemployment rates in these countries may have contributed to their concerns.

Adolescents in the East/Asian countries had high levels of future-related stress and were primarily worried about selecting the right kind of occupation or failing to be admitted to desired vocational training programs. They also reported quite high levels of school-related stress, which supports findings of the strong focus on children's academic performance in middle-class, Asian families (Fuligni, 2007; Henderson, Marx, & Che Kim, 1999).

Adolescents in the continental group had very low levels of school-related stress and the lowest levels of future-related stress. Although not characterized by having "high hopes" for the future, as suggested by Arnett (2000, p. 267), their future perspectives were overall more positive. Being able to discover and explore their own interests was very important for them. Nevertheless, they were generally uncertain about what they should do after finishing their basic schooling. Compared with their age-mates in the other two groups, they were probably less pressured by family obligations. Also, in planning their futures they might have felt that they could freely pursue their own interests, independently choose their professions, and expect state support to explore different options. Thus, overall, they seemed to perceive social change as being more beneficial, compared to their age-mates in other regions of the world (Tomasik, Silbereisen, & Heckhausen, 2010).

Our findings of frequently reported school-related stressors underscore how central the successful completion of education for future professional goals was for all of the participating adolescents. Among the school-related stressors, the pressure to achieve good grades was perceived as being most stressful (rank 1 in all regions). Similar findings have been reported for North American (Kouzma & Kennedy, 2004) and European adolescents (Gelhaar et al., 2007).

Finally, the finding that stress levels in the domains of future and school increased with age suggested that older adolescents were under more pressure to accomplish the main developmental tasks of this age, which is in accordance with other research findings (Malmberg & Trempala, 1997). The particularly high levels of future-related stress in females in all countries highlight that the developmental deadlines for females to accomplish certain tasks

(e.g., pursue a career and have children) are more rigid (Nurmi & Salmela-Aro, 2002). Further, females may be under greater pressure to obtain good grades in school because they are competing with males for highly desirable careers.

To summarize, issues related to recent societal change were reflected in adolescents' perceptions of future- and school-related stressors. Adolescents growing up in cultures which emphasize family obligations and grant adolescents little autonomy and freedom to explore were more worried about their futures. Because these adolescents were also concerned about performing well in school, it is warranted to suggest that they felt more sociocultural pressure to assume adult roles and responsibilities earlier. In contrast, it seems that adolescents growing up in a developmental context supporting individual choices and offering more favorable opportunity structures during the transition process were aware that they could solve adolescent-typical tasks later in emerging adulthood (Badger, Nelson, & Barry, 2006).

Agency in coping

Our findings showed that the developmental context was associated with the ways of coping with stress. In contrast to earlier studies on North American and European samples (Garnefski, Legerstee, Kraaij, van der Kommer, & Teerds, 2002; Seiffge-Krenke et al., 2009; Skinner et al., 2003), reflection did not emerge as a separate coping style across countries. Instead, strategies associated with this coping style (e.g., thinking about the problem and weighing different solutions) were combined with support-seeking strategies. The reflection/support-seeking coping style was used the most often across all countries and problem domains, demonstrating the remarkable agency of all adolescents when coping with everyday school- and future-related stressors in times of social change (Larson, 2011). Adolescents in all countries preferred to use family and friends as support-providers to deal with future- and school-related stress, with family support ranking first in nearly all countries and regions. This important finding challenged our speculation that parents in some regions of the world might be unable to optimally support their child's exploration or serve as models in the job and career domains (Côté, 2002). Also, although during adolescence friends typically replace the family as primary support providers (Granic, Hollenstein, Dishion, & Patterson, 2003), this finding suggests that parents continue to be important sources of support. Contrary to our expectations, we found no evidence that adolescents from the South or East/Asian groups, who were thought to be more family-oriented, relied more on their family networks in coping with stress than adolescents in the continental group did. It is interesting that all of the adolescents showed greater efforts to cope with school-related stressors than with future-related ones. This situation-specific effect may be due to the greater controllability of school-related stressors (Griffith, Dubow, & Ippolito, 2000) compared to the more anticipatory stress associated with the challenges of future tasks.

Emotional outlet was the second—but significantly less important—coping style used by adolescents in our cross-cultural study. In accordance with studies on ethnic differences in temperament and emotion regulation (Rushton, 1999), adolescents from the East/Asian group showed stronger emotion regulation when dealing with future- and school-related stressors. Adolescents from the South group also exhibited low levels in the use of this coping style, suggesting that stronger family ties and adaptation to family and sociocultural values may have prohibited the open expression of negative emotions.

In all countries and across all regions, withdrawal/denial coping strategies were used the least often. Thus, overall, all of the participants in our study dealt with the challenges of adolescence proficiently; that is, they were able to maintain agency despite dramatic social changes, supporting claims that today's youth possess the competency to proactively deal with changes and challenges of a disorderly world (Larson, 2011). There was no indication for disengagement of youths living under less favorable conditions (Tomasik, Silbereisen, & Heckhausen, 2010). More important, we found no indication that youths from more traditional backgrounds (e.g., with stronger family obligations) were less active in coping with everyday stressors in the domains of school and future. This supports Kağıtçıbaşı's (2005) findings and underlines that social structures marked by interdependency do not necessarily preclude individual agency or that primary control strategies will be used less often to deal with stressors imposed by social change (Heckhausen et al., 2010). This overall positive picture is further corroborated by our finding that older adolescents were better at coping (i.e., they used more reflection and support-seeking and less emotional outlet and withdrawal/denial strategies than younger adolescents did). Although the age effect on coping style was small (due to the sampling of adolescents with a narrow age span), it reflects how adolescents actively dealt with their stress and that they became better able to regulate negative emotions with age.

The ability to manage stress has important health consequences. Studies on North American (Farrell et al., 2006; Miranda & Claes, 2009) and European samples (Seiffge-Krenke & Klessinger, 2000) have shown that females' withdrawal and increase in emotion-focused coping to deal with high levels of stress are linked to increased symptomatology. Such findings point to a stress-generating mechanism in females (Rudolph, 2002). It is important to note that, although the females in our study reported higher stress levels than males did, their levels of emotional outlet or withdrawal/denial were not higher. Instead, females tried more to cope adaptively. In accordance with earlier studies showing that females are more likely to use social support (Compas et al., 2001; Hutchinson, Baldwin, & Oh, 2006; Tamres et al., 2002), females in our study exhibited higher levels in reflection/support-seeking than males did, particularly in dealing with school-related stress.

Our findings showed that the stress perceptions and coping styles of adolescents in different regions of the world shared remarkable similarities. Although these similarities were perhaps due to the standardized sampling of high school student populations, other factors pointed to a convergent developmental context in different countries around the globe (Arnett, 2002). For example, in many developing countries the average level of schooling has increased, approaching that for industrialized countries. In addition, as a result of globalization, middle-class adolescents all over the world are increasingly using the same media sources (Arnett, 2002). Finally, some countries (e.g., in Asia) have experienced strong increases in economic growth (World Bank Data Catalogue, 2009), whereas differences between industrialized countries have narrowed since the introduction of a free labor market within the European Union (Eurostat, 2010).

Conclusions for coping theory and prevention

Several of our findings contribute to coping theory and prevention. A general yet important finding was that developmental context

was strongly associated with adolescents' stress perceptions and coping styles. Our study was based on standardized samples of adolescents (i.e., with equal distributions of gender, similar age ranges, and a similarly high level of schooling) from different countries. The impact of situational factors was strong, with high effect sizes for problem domain compared to the low differences for the impact of age and gender in all regions. Adolescents made greater efforts to cope with school-related stress than with anticipated stressful situations pertaining to the future. The adolescents' rankings of future- and school-related stressors and their relative use of coping strategies were quite similar across regions, but substantial differences in the mean stress levels and the dominance of certain coping styles emerged, depending on region. Adolescents from industrialized countries (the continental group) experienced considerably less stress and were more active at coping, compared to age-mates from the other regions of the world. Current prevention and intervention models for coping are underdeveloped with respect to the integration of other sociocultural contexts and backgrounds. Such models might profit, for example, by acknowledging that the manner in which ethnic minority adolescents cope with stress may be unexpectedly different, but not necessarily maladaptive (Yasui & Dishion, 2007). It is likely that withdrawal strategies, which put individuals at risk for psychopathology in Western contexts, are acceptable in other cultures and thus linked with good health outcomes.

Limitations

Overall, our findings demonstrate the complex interactions between developmental context, stress, and coping. However, some limitations should be noted. First, we did not study adolescents with lower levels of schooling or who were already working. The opportunity structures and demands associated with the transition to adulthood for these adolescents might be different. Second, future studies should include other stressors, for example relationship stressors, whereby an even stronger impact of culture on stress perception and coping in the relationship domain can be expected (Seiffge-Krenke, 2011). Third, future studies should endeavor to investigate adolescents in their real-life contexts and include interview-based assessment methods (Gould, Hussong, & Keeley, 2008) in order to validate item difficulty, more fully capture the coping process, and better understand the roles of friends and family as support providers. Such approaches could shed light on some speculations concerning the greater pressure of family obligations in some countries, the perceived barriers or challenges due to rapid social change (Tomasik, Silbereisen, & Pinquart, 2010), and the narrower developmental deadlines for females (Heckhausen et al., 2010). Finally, a limitation of our study was its cross-sectional design. Therefore longitudinal studies over an extended time span are warranted in order to better capture changes in stress perception and coping style and analyze their relative contributions to health outcomes (Rescorla et al., 2007).

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