

Agency, Control, and Means–Ends Beliefs About School Performance in Moscow Children: How Similar Are They to Beliefs of Western Children?

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This study examined the development of school performance-related beliefs and their link with actual academic performance in Moscow children (Grades 2–6, $N = 551$) using the Control, Agency and Means–Ends Interview (CAMI). Results revealed much intercultural convergence with Western samples, coupled with context-specific variations. Similarities involved (a) the CAMI factor structure, (b) the correlational nexus between beliefs and performance, (c) the developmental trends, and (d) the configuration of means–ends beliefs. Differences involved beliefs about teachers and ability, and gender differences, favoring girls, in the agency and control beliefs. In general, Moscow children displayed a Westernlike view of the causes of school performance and of themselves as being agentic and capable of personal control over their performance outcomes.

When considering the development of self-related cognition, such as self-ascribed potential for academic achievement (e.g., self-efficacy and control beliefs), one could easily suggest that major differences should exist between children schooled in Western versus non-Western societies. These societies are thought to be characterized by substantially different views of the self, associated, for instance, with predominantly individualistic versus predominantly collectivistic orientations, respectively (Berman, 1990; Hofstede, 1991; Meyer, 1988; Triandis, 1989). By assuming, however, profound differences between Western and non-Western views of the self (e.g., by ascribing the self-efficacious, internally controlled individual to the standards of Western societies only), we may be underestimating possible similarities in certain domains, such as schooling. The issue is far from being fully examined in empirical studies. We do not know, for example, how much children from different sociocultural contexts diverge, if at all, in their beliefs related to school performance.

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Using an established theoretical and empirical framework of research on means–ends (causality), agency (self-efficacy), and control beliefs in the domain of school achievement (Little, Oettingen, Stetsenko, & Baltes, 1994; Oettingen, Little, Lindenberger, & Baltes, 1994; Skinner, Chapman, & Baltes, 1988a, 1988b, 1988c), this study examined, perhaps for the first time, the nature and development of school performance-related beliefs in Moscow children as representative of a non-Western society.¹ Specifically, we pursued questions about (a) the structural composition of school performance-related beliefs, (b) the link between beliefs and actual school performance, and (c) age-related changes in these beliefs across middle childhood. We focused on how children of different ages viewed the relative importance of causes potentially involved in producing school-related outcomes (i.e., mean-level differentiation) and whether, with age, children discriminated more between these causes (i.e., correlational differentiation).

Our purpose in cross-culturally evaluating children's school performance-related beliefs is to possibly shed light on important characteristics of these beliefs and their development, by varying the quasi-experimental dimension of sociocultural

¹ We conducted the study in Moscow in 1990, when the Soviet Union still existed and more than a year before the August coup of 1991. Again, we emphasize that our Western versus non-Western dichotomy was not based on geographical lines but rather political ones. This dichotomy does not coincide with the Western versus Eastern (or European vs. Asian) dichotomy but rather pertains to the difference between developed Western social-capitalist democracies (Western Europe, the United States, Canada, etc.), as characterized by individualistic values of personal freedom, independence, and so forth, on the one hand, and the countries characterized by predominantly collectivistic orientations, on the other. The latter pole comprises a mixture of traditional cultures of the East, nonindustrialized developing countries, and Communist countries of Eastern Europe. That is why Russia, although it is a European country in geographical terms, is regarded as exemplifying a non-Western (i.e., nonindividualistic) society in most cross-cultural studies (e.g., Kaiser, 1984) and, accordingly, in the present article.

context. In this case, for example, if the strong pattern of age-related differentiation in children's means-ends (causality) beliefs found in Western cultures (e.g., Skinner, 1990b) was replicated with Moscow children, an important commonality in children's conceptions of how school performance comes about would be indicated. In addition, such a finding would follow well the meta-theoretical views of development as a process of progressive differentiation (see, e.g., Skinner, 1990a; Werner, 1957). Inquiry beyond the confines of one society type expands the range of possible interpretations of the developmental sources of school performance-related beliefs and thereby indicates viable directions for future research.

Performance-Related Beliefs in the School Context

Over recent decades, children's beliefs about the causes of school performance-related outcomes and about their own role in producing these outcomes have been intensively studied under various names (for overviews, see M. M. Baltes & Baltes, 1986; Sternberg & Kolligian, 1990), such as locus of control (Lefcourt, 1976; Rotter, 1966), perceived control (Connell, 1985; Weisz, 1983), agency beliefs (Chapman, Skinner, & Baltes, 1990), self-efficacy (Bandura, 1990; Schunk, 1991), explanatory style (Nolen-Hoeksema, Girgus, & Seligman, 1986), and others. Regardless of the differences in theoretical and methodological frameworks used, researchers have converged on the idea that children's performance-related beliefs play an important role in realizing actual school performance (see Findley & Cooper, 1983; Skinner, 1990b; Stipek & Weisz, 1981, for reviews). At the same time, the need to differentiate between various sets of beliefs (e.g., agency vs. means-ends beliefs) to specify the link between beliefs and performance as well as to understand the development of these beliefs across childhood has been widely acknowledged (e.g., M. M. Baltes & Baltes, 1986; Flammer, 1990; Weisz, 1990).

A quite robust and consistent body of findings has emerged in studies based on the action-theory approach to school performance-related beliefs (Chapman et al., 1990; Skinner et al., 1988a, 1988b, 1988c). In this approach, three belief types about school performance are distinguished according to the relations among the structural components of human action: (a) *agency beliefs*, which are the perceptions by the agent of his or her access to a variety of important means (i.e., degree of possession of effort, ability, teachers, and luck) for school performance; (b) *control beliefs*, which refer to a sense of being an agent able to produce a desired outcome (or avoid a negative outcome) without specifying the means involved; and (c) *means-ends beliefs* or causality beliefs, which are generalized understandings of the determining links between certain means (i.e., effort, ability, teachers, luck, and unknown causes) and a given outcome such as school performance. An instrument—the Control, Agency, and Means-Ends Interview (CAMI)—has been developed to separately assess these three belief types (Skinner et al., 1988b; see also Little et al., 1994).

Studies conducted in this framework have provided clear evidence of the differential nexus between beliefs and school performance. For example, although means-ends beliefs are not substantially linked to performance, personal agency beliefs pertaining to effort, ability, and luck are strongly and systematically related to it. Moreover, there is a middle-range relation

between control beliefs and school performance (Chapman et al., 1990; Oettingen et al., 1994). This pattern of results has been replicated in other studies conducted in a similar framework (e.g., Skinner, Schindler, & Tschechne, 1990). The findings fit well with the idea that children's agency, control, and means-ends beliefs about school performance are conceptually distinguishable. The distinction is particularly clear for means-ends beliefs versus agency and control beliefs. Specifically, a child could well believe that certain means (such as effort) generally lead to an outcome (e.g., good grades) yet not believe that he or she personally possesses these means or that he or she has any control over the outcome.

Furthermore, research using this threefold conceptualization has helped to elucidate developmental trajectories of school performance-related beliefs across middle childhood (e.g., Oettingen et al., 1994; Skinner & Chapman, 1987; Skinner et al., 1988a). This research has shown that the average level of agency and control beliefs does not change substantially across middle childhood (ages 7 to 12 years). On the other hand, a strong pattern of age-related differentiation among the causes potentially involved in producing school outcomes (i.e., means-ends beliefs) has been revealed across this same age range; this progressive differentiation appears both in the perceived effectiveness of the causes as well as in the intercorrelations among them. That is, younger children have a more generalized, unspecified understanding of what determines good or bad school performance—they appear to believe that effort, ability, luck, teachers, and unknown causes all play a fairly equipotent role in achieving success or avoiding failure. In contrast, older children appear to discriminate more among these causes, both in terms of mean levels and intercorrelational patterns among the causes (e.g., Skinner, 1990a, 1990b). For instance, children in later middle childhood consistently rate the role of effort and ability higher than the role of teachers, luck, and unknown causes.

Cultural Specificity Versus Intercultural Similarity of Beliefs About School Performance

The findings regarding the dimensions of school performance-related beliefs, their nexus with actual achievement, and their development across middle childhood are important both theoretically and practically. Such findings provide insight into the relation between self-related cognitive phenomena and school performance as well as suggest potential guidelines as to how academic achievement might be fostered (e.g., Flammer, 1990; Sternberg & Kolligian, 1990). However, the mainstream of research on children's beliefs in the school domain has been based on samples of Western children and has been conducted predominantly in the context of Western schooling systems (North American, West European).² Do the findings pertain only to the children raised in the rather specific sociocultural setting of Western countries? Or do the reported regularities

² A study conducted by Oettingen et al. (1994) is an exception in this respect, because it involved a sample of East Berlin children and was conducted before the reunification of Germany (i.e., in the former German Democratic Republic with its Communist political and schooling systems).

have a more general nature, common at least for countries of the industrialized world?

In addressing this issue, some researchers have suggested, for instance, that self-efficacious and agentic individuals emerge only in the context of specific institutional supports provided by Western societies (e.g., Meyer, 1988; but cf. Bandura, *in press*; Oettingen, *in press*). Relatedly, self-reliance is assumed to be promoted by individualistic values putatively more typical to Western societies (e.g., Berman, 1990; Triandis, 1989). Moreover, beliefs about an internally controlled individual as being an agent responsible for producing outcomes are viewed as the normative standard of Western countries (e.g., Skinner et al., 1990). However, these general and widely held assumptions have not been tested with regard to school performance-related beliefs of children reared in industrialized non-Western countries with predominantly collectivistic values (e.g., Communist societies of the former Eastern block).

Goals of the Study: Expected Similarities and Differences

The present study explored the school performance-related beliefs of a sample of Moscow children, using the CAMI instrument that has been well validated in previous studies in this domain (Little et al., 1994; Skinner et al., 1988a, 1988c). This particular sample was chosen because it exemplifies a non-Western population of children that allows a further test of the generality of school performance-related beliefs as measured by the CAMI. Moreover, and to our knowledge, school performance-related beliefs about agency, causality, and control have not been examined systematically in Russian children.

In organizing our thinking about Russian children's beliefs in this domain, we focused on the potential influence of general school-related factors such as schooling patterns and formats (e.g., classroom organization and structure) as well as educational values and conceptions (e.g., parents' beliefs about the importance of education). Although we did not include explicit measures of the schooling environment to directly test our basic expectations, we assumed that children's school-related experiences are a central factor influencing their generalizations and beliefs about school performance (see also Chapman et al., 1990; Findley & Cooper, 1983). With such an assumption, we emphasized proximal school-related influences as compared with more distal factors (e.g., a society's economical, political, and ideological characteristics).

This general assumption is consistent with theoretical approaches emphasizing the importance of proximal factors in producing individual differences (e.g., Bronfenbrenner, 1976; Vygotsky, 1978). Moreover, formal schooling is a pervasive societal institution that (a) operates relatively independently of other societal institutions (e.g., Gardner, 1991) and (b) is characterized by generally similar goals, procedures, settings, and activities throughout the industrialized world (e.g., Gardner, 1991; Inkeles, 1983). We reasoned, then, that because of the high degree of commonality in the formats and practices of classroom teaching and in the general conceptions about formal education, many features of Russian children's school performance-related beliefs would be similar to non-Western children's beliefs.

Previous research focusing on an intranational, comparative study in Germany of school performance-related beliefs involving East and West Berlin children provides some support for these expectations. This previous study, conducted before the political reunification of Germany, examined children's control, agency, and means-ends beliefs in two substantially different social contexts: social-capitalist West Berlin and Communist East Berlin (Oettingen et al., 1994). Oettingen et al. found, for example, remarkable similarities between East and West Berlin children in (a) the measurement structure of the CAMI constructs and (b) the mean-level and correlational configuration of the children's means-ends or causality beliefs.

Along with the expected similarities, we assumed that relatively pronounced differences between Moscow children and children schooled in Western societies might occur as a result of context-specific modulations in the school-related environment. Because a given schooling system and its associated school-related environment is embedded in an overarching sociocultural context of a given society (Hofstede, 1991; and see Oettingen, *in press*, regarding the impact of cultural values on the formation of efficacy-related beliefs), context-specific modulations of the children's beliefs may emerge. If found, such differences could be interpreted in a general, a posteriori manner as reflecting unique aspects of Russian children's school-related environment.³

Although we offer here a number of basic expectations regarding similarities and differences between Moscow children and their Western peers, we must emphasize that our study is not aimed at directly testing the overall effects of schooling environments or the effects of particular school variables. Because we tested children from a non-Western but European and industrialized country and because we did not include concrete measures of the various school-related environments (e.g., school formats and structures as well as parents' beliefs about what produces good or bad school performance and their values regarding the importance of getting an education), support for our expectations can only be considered tentative.

In summary, our study had three main goals: (a) to examine the structural invariance of school performance-related beliefs in Moscow children as measured by the CAMI; (b) to further test the concurrent, criterion-related validity of the threefold conceptualization of performance-related beliefs (i.e., agency, control, and means-ends) by examining the relations between these beliefs and school achievement in a non-Western sample of children; and (c) to explore possible cultural or schooling-related specificity in Moscow children's beliefs, focusing on age-related differences and modulations in the perceived relative

³ The issue of defining a unique, homogeneous schooling system is complex. Although within-system variability (e.g., individual teacher's styles and strategies, regional differences in curricula) can contribute to the diversity of a national schooling system, previous cross-cultural research has demonstrated that characteristics of a given national schooling system can be used as effective explanatory features (see Stevenson, 1988, for a review). Because the educational system of our sample was highly uniform and standardized, we, too, maintain that the features of the school-related environment described here provide fruitful explanatory possibilities for the pattern of data and further directions for future research.

importance of the causal categories that determine performance and in the degree to which children believe that they have access to these means.

Method

Participants

We tested 551 Russian boys and girls from Grades 2 to 6 (ages 8–12 years) attending two Moscow schools. The sample consisted of 100 to 124 children per grade level (approximately 47% boys and 53% girls on average). Both schools were located in parts of Moscow where “average” Muscovites live, representing mostly working class people and office workers. We conducted the study in November and December 1990, when the official Communist regime still existed and the traditional Soviet educational system was still intact. Both multivariate and univariate tests of the effects of schools revealed no significant differences (all p s > .01).

Measures

Control, Agency, and Means–Ends Interview (CAMI). To assess children’s school performance-related beliefs, we translated and verified through back translation the 58-item version of the CAMI (Little et al., 1994; Skinner et al., 1988b). The CAMI measures 10 school performance-related belief dimensions across three categories: control beliefs, agency beliefs (effort, ability, luck, and teachers), and means–ends beliefs (effort, ability, luck, teachers, and unknown causes).⁴ We gave the CAMI to the children in their classrooms during school time in the absence of the teacher. The items were read aloud, while the children silently followed along and answered each question (using a 4-point scale: 1 = *never*, 2 = *seldom*, 3 = *often*, and 4 = *always*). We told the children that no one they knew would see their individual answers, that their answers were neither right nor wrong, and that everyone should write down which answer they felt was the best. Sample items for each category and associated subdomain can be found in Oettingen et al. (1994).

Given the closed-ended format of such an instrument, the relevance of the included dimensions (e.g., effort, ability, or luck) deserves consideration. Specifically, the subdimensions of agency and means–ends beliefs contained in the CAMI were determined on the basis of theoretical and substantive concerns as well as from extensive interviews with German and American children in which the children spontaneously generated reasons for school performance (Skinner et al., 1988a, 1988b, 1988c). In addition, the agency and means–ends subdimensions contained in the CAMI have been validated in subsequent empirical research with children of various cultural backgrounds (e.g., Little et al., 1994; Oettingen et al., 1994; Skinner et al., 1988a). Finally, the means–ends beliefs category represents a critical control check of whether Moscow children, at the level of general expectations, view the same set of means (causes) as similarly important in regulating school performance as do Western children. Given these considerations, we viewed the risk of both underrepresentation of the belief dimensions and overgeneralization of the findings as generally minimal.

School grades. We used the children’s school grades as an index of academic performance, taking the year-end school grades for mathematics and Russian language from class records. These two grades correlated .57 in the overall sample and ranged from .52 to .61 at each grade level. To control for teacher differences in grading practices, we standardized the teacher-assigned grades within each classroom.

Analytic Procedure

MACS analyses as statistical strategy. We used multiple-group mean and covariance structures analyses (MACS; see Jöreskog & Sör-

bom, 1989; Little, 1994) for all by-grade comparisons and a single group MACS analysis for the overall sample. A MACS framework has three main advantages: (a) It tests whether the hypothesized factor structure of the item responses is tenable, (b) it corrects for measurement error (i.e., disattenuation) to allow more veridical estimates of mean level and correlation, and (c) it explicitly tests for equivalence of comparison (i.e., metric invariance, in the case of the multiple-group model).

More specifically, the first advantage of a MACS analysis is that it allows a direct test of whether the hypothesized dimensions of the CAMI instrument emerge for this sample of participants. If the expected factor structure is consistent with the data (as indicated by quality of fit), then from a psychometric viewpoint both the internal and external structural equivalence (validity) of the instrument is supported. By internal validity or equivalence, we mean that the pattern of convergent and discriminant covariations among the indicators clearly mark and discriminate the expected factors. By external equivalence or validity, we mean that the theoretical conception, as it is operationalized in the instrument, is generalizable to a new sociocultural context. Second, with MACS analyses, information in the factor space is represented at a reliable, disattenuated level. Because the information on *means* or level of endorsement is also included in a MACS analysis (i.e., analyses are conducted on moment matrices among the indicators), comparisons of the covariations as well as the means of the latent constructs are made at a disattenuated (i.e., more veridical) level of analysis (Little, 1994; Meredith, 1993). Also note that by including the indicator means in the analyses, the internal and external validity (equivalence) assessments of the factor structure become more stringent tests because both the means and the covariations of each indicator must be consistent with the hypothesized structure. Finally, a MACS framework allows us to test whether comparisons between groups (i.e., between grade levels) are made on the same underlying construct (Baltés & Nesselrode, 1973). This test is accomplished by specifying equality of the measurement level across groups (i.e., metric invariance; see Jöreskog & Sörbom, 1989; Little, 1994) and evaluating the goodness of fit. This condition also indicates that, from a psychometric point of view, the data and theoretical conception are age invariant, that is, generalizable to each age level studied (Little, 1994; Nesselrode, 1983).

Model structure and analyses. On the basis of past research, we know the prevalent and theoretically consistent measurement space for Western samples. Little et al. (1994) and Oettingen et al. (1994) described, respectively, a 10- and 8-construct representation of the CAMI instrument; we used both forms for our analyses. To represent the constructs, we aggregated the items into sets of three indicators for each construct (i.e., either 30 indicators for the 10-construct representation or 24 indicators for the 8-construct representation; see Little et al., 1994, for the justification of the distinction between the two representations of the CAMI). For the 10-construct representation, we specified each agency category separately (each termed Agency: Effort; Agency: Ability; and Agency: Luck; see Little et al., 1994); for the 8-construct model, we specified these subdomains as a single agency construct (i.e., Agency: EAL to denote the aggregated effort, ability, and luck dimensions; see Little et al., 1994; Oettingen et al., 1994). Testing both representations allowed us to evaluate whether the separate subdomains behave differently in any of the groups analyzed. Notably, our methods follow exactly those of Little et al. (1994) and Oettingen et al. (1994), who assessed the validity of the instrument in other samples. In addition to the CAMI constructs, each model contained an Academic Performance factor with two indicators, namely, the year-end grades for verbal and math performance.

For the overall, one-group MACS model, we included three addi-

⁴ The instrument is available from the authors in German, English, and Russian.

Table 1
Summary of the MACS Model Fit Statistics

Model description	<i>df</i>	χ^2	Ratio	NNFI	IFI
Overall sample					
8-factor, null model	431	12,064.68			
8-factor, final model	313	612.42	1.957	.965	.975
10-factor, null model	626	14,312.75			
10-factor, final model	471	765.58	1.625	.971	.979
Grade-level samples					
8-factor, null model	1886	16,502.75			
8-factor, freely estimated model	1395	1,834.52	1.315	.959	.971
8-factor, metric invariant model	1535	2,060.23	1.342	.956	.965
10-factor, null model	2801	17,815.28			
10-factor, freely estimated model	2145	2,902.31	1.353	.934	.952
10-factor, metric invariant model	2317	3,153.84	1.361	.933	.946

Note. MACS = mean and covariance structures analysis; *df* = the model degrees of freedom; χ^2 = the LISREL maximum likelihood chi-square estimate; ratio = the χ^2/df ratio; NNFI = the non-normed fit index; IFI = the incremental fit index.

tional variables to estimate and thus control for their effects. The first was a dummy-coded variable representing the effects of gender (Gender), the second represented the linear effects of grade level in school (Grade), and the third represented the quadratic effects of grade in school (Grade²); we included this third variable to evaluate and thus control for any nonlinear developmental relations in the data. For the five-group (i.e., by-grade) MACS analyses, we added only a dummy-coded variable representing gender. In each of the measurement models (i.e., the one-group and five-group models), the effects of the additional variables were estimated as latent variable regressions on each factor, except for Academic Performance; here, the effects of gender were estimated directly on the indicators because differential patterns of gender effects may exist for verbal and math performance.

In the specific case of the five-group MACS analyses, we tested two models. The first model tested whether the hypothesized 10-factor structure held for each grade level, without placing any constraints across the grade levels. The second model specified metric invariance of the measurement space (i.e., equality constraints on the factor loadings across grade level, testing factor invariance) but placed no constraints on the latent space. That is, the factor loadings and mean estimates of each indicator for a given latent factor were constrained to be equal for each group (i.e., Grades 2 through 6). However, it is important the means, variances, and covariances for each latent construct were allowed to vary freely both within and between each grade level. This latter type of psychometric representation has two main advantages: (a) It demonstrates that the psychological processes underlying the item responses are equivalent or invariant, but (b) it allows possible sources of age-relevant developmental changes of the psychological processes to emerge (see, e.g., Little, 1994; Nesselroade, 1983).

Finally, we assessed model fit using the non-normed fit index (NNFI; Bentler & Bonett, 1980) and the incremental fit index (IFI; Marsh, Balla, & McDonald, 1988); we followed standard convention in using .90 as the criterion of model fit. Tests of significance were based on the LISREL *T* values (Jöreskog & Sörbom, 1989).

Results

We first assessed the factorial validity of the responses. We then analyzed, in respective order, (a) the pattern of correlation between the belief types and school performance; (b) the age

trends in agency, control, and means–ends beliefs across middle childhood (i.e., mean level differentiation); (c) the age-related correlational differentiation between the belief types; and, finally, (d) the effects of gender.

Internal and External Validation of the Hypothesized Factor Structure

We fit the models described earlier to the data, and the outcome was clear-cut. All of the models showed high levels of fit, providing strong support for the internal and external validity (generalizability) of the CAMI instrument in this sample of Moscow children. Specifically, the 10-factor solution as well as the 8-factor solution, when applied to the overall sample, showed strong relative fit: NNFI = .971 and IFI = .975, for the 10-factor model, and NNFI = .965 and IFI = .975, for the 8-factor solution (a summary is presented in Table 1). For both models and all models reported, no additional parameters (e.g., correlated residuals, dual-factor loadings) were estimated for these models.

Regarding the five-group models, the 10-factor and 8-factor models reproduced the mean and covariances of the measured indicators at similarly high levels at each grade level, both when we allowed the factor loadings to vary across grade levels as well as when we enforced the constraint of metric invariance. That is, the 10-factor model, applied to each grade level and allowing the factor loadings to vary freely, showed acceptable levels of fit (NNFI = .934, IFI = .952); similarly, the 8-factor model also produced high levels of fit (NNFI = .959, IFI = .971; see Table 1). When we placed the constraint of metric invariance across each grade level—again, testing measurement equivalence for each grade level—each model provided good relative fit, similar to the freely estimated models (NNFI = .933 and IFI = .946 for the 10-factor model, and NNFI = .956 and IFI = .965 for the 8-factor model; see Table 1).

The implications of these results are twofold. First, because the hypothesized factor structure, which is based on theory and

Table 2
Estimated Relations Between Academic Performance and the CAMI Constructs by Grade Level and Overall

CAMI construct	Type	Grade level					Total
		2	3	4	5	6	
Agency beliefs							
EAL	Dis	0.76	0.36	0.66	0.57	0.72	0.59
	Raw	0.59	0.29	0.52	0.39	0.53	0.45
Effort	Dis	0.66	0.29	0.63	0.51	0.47	0.48
	Raw	0.46	0.22	0.44	0.31	0.37	0.35
Ability	Dis	0.70	0.37	0.59	0.58	0.61	0.55
	Raw	0.51	0.25	0.44	0.42	0.43	0.40
Luck	Dis	0.77	0.40	0.57	0.37	0.79	0.56
	Raw	0.56	0.29	0.44	0.24	0.58	0.41
Teachers	Dis	0.62	0.23	0.43	0.36	0.23	0.31
	Raw	0.25	0.15	0.28	0.20	0.13	0.19
Means-ends beliefs							
Effort	Dis	-0.01	0.41	0.18	0.18	0.25	0.21
	Raw	0.02	0.24	0.13	0.09	0.19	0.13
Ability	Dis	-0.36	0.06	0.15	-0.27	0.28	0.01
	Raw	-0.20	0.07	0.13	-0.17	0.21	0.02
Luck	Dis	-0.33	-0.02	0.01	-0.38	-0.20	-0.14
	Raw	-0.22	-0.04	0.00	-0.24	-0.16	-0.11
Teachers	Dis	-0.39	-0.05	-0.08	-0.17	-0.20	-0.16
	Raw	-0.28	-0.04	-0.07	-0.11	-0.15	-0.12
Unknown	Dis	-0.27	-0.06	-0.05	-0.21	-0.10	-0.11
	Raw	-0.19	0.03	-0.04	-0.13	-0.07	-0.08
Control beliefs							
	Dis	0.41	0.15	0.48	0.49	0.64	0.40
	Raw	0.33	0.13	0.35	0.27	0.42	0.29
	<i>n</i>	100	124	109	112	106	551

Note. CAMI = Control, Agency, and Means-Ends Interview; EAL = effort, ability, and luck; Dis = the maximum likelihood estimate of the disattenuated correlation; Raw = the raw data Pearson product-moment correlation. The effects of gender have been partialled from the by-grade estimates, and the effects of gender, linear grade, and quadratic grade have been partialled from the overall (Total) estimates. For the means-ends beliefs, significance from zero ($p \leq .01$) is indicated by boldface. For the agency and control beliefs, nonsignificance from zero ($p \geq .01$) is indicated by boldface. The significance levels are based on the LISREL *T* values associated with all estimated parameters.

previous empirical research with Western samples, was strongly supported, the psychometric equivalence (validity) of the CAMI instrument generalizes to Moscow children. Second, the psychological and psychometric measurement structure of the constructs appears to be age or grade invariant.

Rank Order of Correlations Between Beliefs (Agency, Control, Causality) and Actual School Performance

The second major research topic of this study concerned the correlational nexus between the three belief types and actual school performance. In Western samples (e.g., Chapman et al., 1990), the magnitudes of these correlations vary consistently. Agency beliefs and school performance display a sizable positive correlation, followed by control beliefs. The correlation between means-ends or causality beliefs and school performance, however, is typically low or nonsignificant.

Estimates for the Moscow sample of the link between aca-

demical performance as assessed by course grades and the different beliefs measured by the CAMI are presented in Table 2. Both the disattenuated estimates from the MACS models as well as the raw data correlations are presented for comparative purposes. Note first that the correlational nexus shown in Table 2 is highly consistent with findings from Western research (Chapman et al., 1990; Oettingen et al., 1994) and our hypotheses about Moscow children's perceptions of the relative importance of the different school performance-related beliefs.

Overall correlations. Agency beliefs for effort, ability, and luck (Agency: EAL) were positively correlated with school performance at a fairly high level ($r = .59, p < .001$). In addition, the three agency subdomains, when estimated as separate factors, showed similarly high correlations with Academic Performance (i.e., Agency: Effort, $r = .48, p < .001$; Agency: Ability, $r = .55, p < .001$; and Agency: Luck, $r = .56, p < .001$; see Table 2). Agency beliefs about the accessibility of the teacher's help (Agency: Teachers) also

Table 3
Mean Levels of the CAMI Constructs by Grade Level and Overall

CAMI construct	Type	Grade level						Age trends		Gender effect
		2	3	4	5	6	Total	Linear	Quadratic	
Agency beliefs										
EAL	Dis	2.93	3.06	2.82	2.92	2.86	2.92	-0.45	-0.00	5.07
	Raw	2.93	2.98	2.89	2.93	2.92	2.93			
Effort	Dis	3.01	3.27	3.05	3.14	3.00	3.10	-1.14	-1.03	5.40
	Raw	3.01	3.10	3.03	3.07	3.01	3.05			
Ability	Dis	2.93	3.02	2.87	3.13	3.18	3.03	1.60	0.78	4.03
	Raw	2.93	2.97	2.90	3.02	3.05	2.97			
Luck	Dis	2.84	2.92	2.62	2.54	2.52	2.69	-1.67	0.01	4.02
	Raw	2.84	2.87	2.74	2.69	2.69	2.77			
Teachers	Dis	2.80	3.11	2.63	2.56	2.39	2.70	-2.07	-0.66	3.30
	Raw	2.80	2.86	2.74	2.75	2.68	2.77			
Means-ends beliefs										
Effort	Dis	2.70	2.60	2.78	2.82	2.95	2.76	1.48	0.58	-0.63
	Raw	2.70	2.67	2.74	2.75	2.80	2.73			
Ability	Dis	2.29	1.78	2.10	1.63	1.80	1.91	-0.41	1.02	-1.86
	Raw	2.29	2.15	2.24	2.07	2.14	2.17			
Luck	Dis	2.18	1.33	1.49	1.03	1.12	1.45	-1.30	3.01	0.90
	Raw	2.18	1.78	1.84	1.62	1.66	1.81			
Teachers	Dis	2.15	1.37	1.56	1.34	1.84	1.65	3.18	4.72	-1.03
	Raw	2.15	1.78	1.89	1.79	2.01	1.91			
Unknowns	Dis	2.48	1.95	2.03	1.74	1.73	1.99	-1.12	1.29	-0.82
	Raw	2.48	2.26	2.30	2.18	2.18	2.28			
Control beliefs										
	Dis	2.96	2.86	2.69	2.74	2.63	2.77	-0.57	0.71	4.08
	Raw	2.95	2.98	2.88	2.90	2.90	2.92			
	<i>n</i>	100	124	109	112	106	551			

Note. CAMI = Control, Agency, and Means-Ends Interview; Type = type of statistic reported; EAL = effort, ability, and luck; Dis = the maximum likelihood estimates of the disattenuated means; Raw = the raw mean. The age trends and gender effects are *z* tests of significance; absolute values greater than 1.96 are at the .05 level and greater than 2.58 are at the .01 level.

evinced a positive significant correlation ($r = .31, p < .001$). Moreover, as expected, control beliefs were positively correlated with school performance ($r = .40, p < .001$) but at a relatively lower level than Agency: EAL. In congruence with our hypotheses, the picture was generally different with respect to the means-ends or causality beliefs. The overall pattern was one of low or nonsignificant correlations; specifically, only two correlations between the means-ends dimensions and Academic Performance achieved significance but with small effect sizes (i.e., Means-Ends: Effort, $r = .21, p < .01$ and Means-Ends: Teachers, $r = -.16, p < .01$); the remaining three means-ends dimensions were not statistically different from zero (see Table 2).

In summary, the results for the overall sample resembled those obtained in research with Western samples. Specifically, the strength of relationship to school achievement for the different sets of performance-related belief corresponded to the following sequence: agency beliefs (except agency beliefs about teachers) → control beliefs → means-ends beliefs. For means-ends beliefs, the correlational nexus was near zero.

Comparisons by grade. Consistent with our hypotheses, Agency: EAL was highly correlated with achievement, be-

ginning in the second grade ($r = .76, p < .001$) and through all the grade levels, except Grade 3, which showed a middle-range relation ($r = .36$; see Table 2). The correlational magnitudes were higher for Agency: EAL than any other belief type across the whole age range. This finding also holds for the separate subdomains of effort, ability, and luck (except Agency: Luck in Grade 5 and Agency: Effort and Agency: Ability in Grade 6 in which control beliefs correlated slightly higher; see Table 2). Note that, with few exceptions, all agency and control dimensions showed significant positive correlations with achievement at all grade levels; exceptions were located in the control beliefs at Grade 3 and Agency: Teachers beliefs in Grades 3, 5, and 6 (all $ps > .01$; see Table 2). It is important to note, however, that none of these beliefs showed negative correlations at any of the grade levels. In contrast, the means-ends beliefs evinced mostly nonsignificant correlations across the sampled grade levels. Only four correlations (out of 25 possible correlations) diverged from this general tendency. Specifically, Means-Ends: Effort evinced positive correlations with achievement in the second grade ($r = .42, p < .01$). In addition, three negative correlations with achievement emerged; namely, Means-Ends: Luck in the second and fifth grades ($r = -.33,$

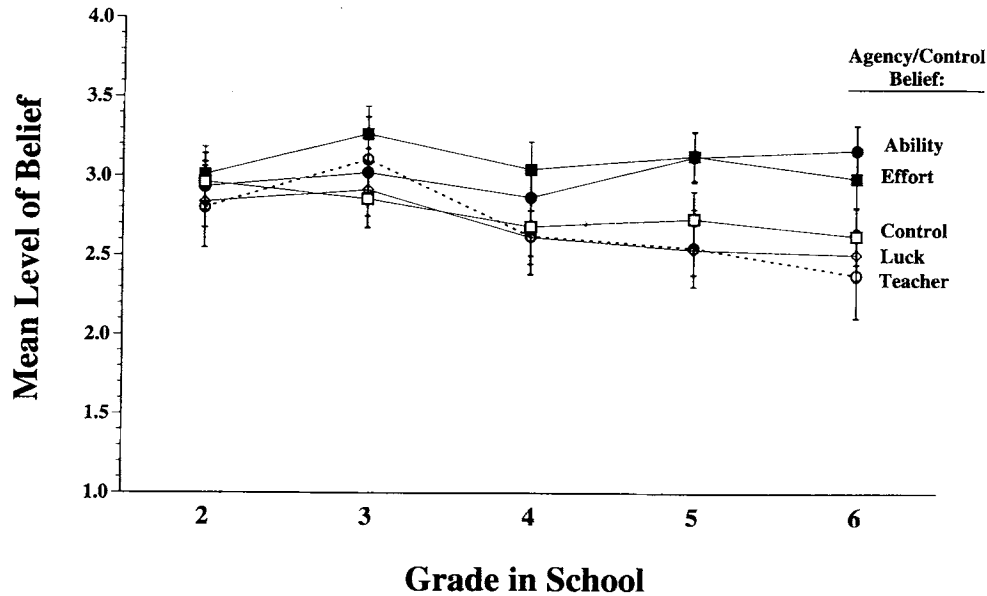


Figure 1. Disattenuated developmental trends for the four agency belief and one control belief dimensions. (Error bars are the LISREL maximum likelihood estimates of the standard error.)

$p < .01$ and $r = -.38$, $p < .01$, respectively) and Means-Ends: Teachers in the second grade ($r = -.39$, $p < .01$).

Age Trends in Agency, Control, and Means-Ends Beliefs Across Middle Childhood

Table 3 presents the estimated latent means for all belief types; it includes also the significance tests of the linear and quadratic effects of grade level as well as the effects of gender; the estimates of these latter effects were taken from the one-group, overall MACS model, whereas the estimated means were taken from the five-group, by-grade MACS model.

Few developmental trends appeared for the agency and control beliefs. In other words, Moscow children across middle childhood did not substantially differ in their ratings of which means were accessible for them (i.e., the agency dimensions) and what performance-related outcomes they could produce (i.e., the control dimension). The one exception was Agency: Teachers; here, the mean levels showed a decreasing linear component ($z = -2.07$, $p < .01$). With age, Moscow children tended to view teachers as less subject to their agency. These age trends are presented in Figure 1. Notably, children believed they had relatively more access to effort and ability than to luck and teachers; in addition and perhaps surprisingly, they believed they had the same access to luck (agency for) as they had to teachers (see Figure 1).

For the means-ends beliefs, the results indicated that, with age, the children increasingly differentiated among the causal categories regarding their expected effectiveness in producing school performance (see Table 3 and Figure 2). Graphically, as presented in Figure 2, this differentiation can be seen in the fanning of the initially similar mean levels, occurring in the third grade and holding through Grades 4, 5, and 6, and is due primarily to two factors. On the one hand, children in the third

grade viewed the role of the teacher and luck as less important than did children in the second grade. Statistically, this drop is accounted for by the significant quadratic component found for Means-Ends: Teachers ($z = 4.72$, $p < .001$) and for Means-Ends: Luck ($z = 3.01$, $p < .001$). Children also viewed unknown causes and ability as relatively less important starting from the third grade (although this difference is not statistically significant). On the other hand, across the age groups, children did not differ in their beliefs about the role of effort in achieving success in school. Means-Ends: Teachers did not show a clear-cut negative age-related difference—the lower levels apparent in Grade 3 were not found in the higher grades (see Table 3 and Figure 2).

Figure 2 also shows the mean level differences between the causal categories, reflecting their relative standing in children's conceptions about the determining factors of school performance. Moscow children at all ages believed that effort played the major role in achieving good or bad grades, whereas all other causes were perceived as less important. Ability and unknown causes attained fairly equal rankings and were viewed as (a) relatively more important than the causal categories of luck and teacher but (b) less important than effort. Notably, luck was consistently regarded by children as the least important causal category, and its lower standing in children's beliefs was even more pronounced in the upper grade levels.

Correlational Differentiation With Age

In Figure 2, we present evidence of differentiation regarding average or mean levels for the five causal categories of means-ends beliefs; that is, after Grade 2, the average levels showed dispersion. In contrast, the agency and control dimensions showed no evidence of mean level differentiation (see Figure 1). A second facet of differentiation is correlational divergence

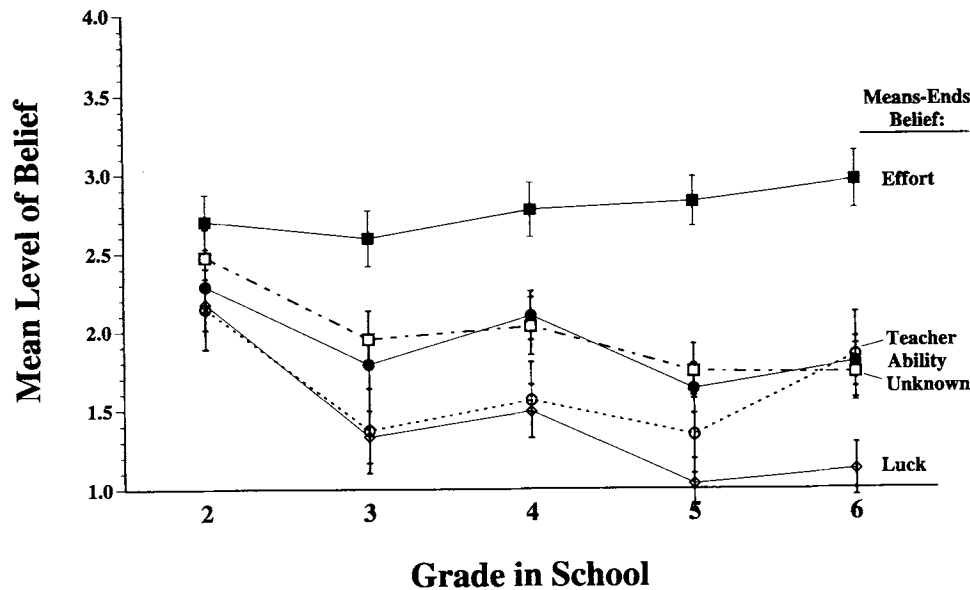


Figure 2. Disattenuated developmental trends for the five means-ends dimensions. (Error bars are the LISREL maximum likelihood estimates of the standard error.)

among the beliefs (Reinert, 1970). In looking at the magnitudes of correlation among the belief subdomains at each grade level, we found further evidence of differentiation among the means-ends subdomains but no evidence of differentiation for the agency and control dimensions. Specifically, our multivariate tests of an overall age-related difference in the correlational pattern among the belief subdomains indicated that whereas the agency and control beliefs showed no differences across grade levels, $\chi^2(40, N = 551) = 48.78, p = .161$, the means-ends beliefs did evince correlational differences, $\chi^2(40, N = 551) = 73.42, p < .001$. The differentiation of the means-ends beliefs can be seen in Table 4.

The correlations among the means-ends beliefs decreased systematically with age, beginning with an overall average correlation of .75 in Grade 2 to an overall average of .33 in Grade 6 (see Table 4). In addition to this overall effect, the average correlations between the specific means showed consistent decreases across the grade levels presented, with few minor exceptions (e.g., effort and ability were slightly higher in Grade 4 than in Grade 3). Such a pattern of differentiation suggests that the mental representations of the five means or causal categories become more independent from each other, not unlike research on the development of mental abilities during the same age period (see Reinert, 1970).

The means-ends correlations showed a general positive manifold, with a few exceptions (e.g., some nonsignificant correlations involving Means-Ends: Effort beginning in Grade 3 and one involving Means-Ends: Unknowns in 6; that is, in general, the ratings of the causes correlated positively). Furthermore, we draw attention to the findings for the causal category of luck. Effort is the only cause that is not a prominent covariate of luck, whereas the category of teachers covaries highly with luck. In other words, children who attributed a high value to luck in

producing school performance also did so for the role of teachers.

For the agency and control dimensions, a consistent positive and high manifold at each grade level was found, ranging from an average correlation (from among the four agency dimensions) of .76 in Grade 6 to an average of .88 in Grade 2, with an overall average of .83. At each grade level, these correlations were higher than the corresponding averages of the means-ends dimensions (all $ps < .05$). However, looking at the average intercorrelation for each dimension separately, we found that agency beliefs about teachers and control beliefs showed the lowest pattern of correlation with the other agency dimensions; but note that this lowered pattern was the same at each grade level. When we removed Agency: Teachers from the averages, the overall average correlation increased to .91. When the control belief dimension was included in the averages, however, the overall average was reduced to .76. Again, the average correlation did not differ with age. For agency beliefs, then, there was no evidence for age-related differentiation on the correlational level. In addition to this lack of age differentiation of the agency and control beliefs, the high positive manifold implies that children exhibited a high degree of individual consistency across these dimensions. On average, children who attributed to themselves high agency for effort and ability also did so for luck and teachers, and vice versa. Such a finding resembles a general optimism-pessimism distinction. That this finding is not a scaling artifact was shown by the high correlation of agency beliefs with actual school performance (see Table 2) as well as the fact that the variances for these dimensions did not differ with age (all $ps > .15$).

Gender Effects in School Performance-Related Beliefs

Because the sample included approximately equal numbers of boys and girls, we were also in a position to test for possible

Table 4
Correlations Among the Five Means-Ends Dimensions for Each Grade Level

Dimension	CAMI construct subdomain					Subdomain average ^a
	1	2	3	4	5	
Grade 2 (overall $M = .75$)						
1. Effort	—					.54
2. Ability	.69	—				.88
3. Luck	.39	.88	—			.75
4. Teachers	.41	.94	.92	—		.76
5. Unknowns	.60	.85	.69	.51	—	.73
Grade 3 (overall $M = .55$)						
1. Effort	—					.31
2. Ability	.49	—				.61
3. Luck	.21	.75	—			.68
4. Teachers	.19	.64	.91	—		.63
5. Unknowns	.33	.53	.54	.46	—	.47
Grade 4 (overall $M = .52$)						
1. Effort	—					.40
2. Ability	.78	—				.62
3. Luck	.05	.55	—			.54
4. Teachers	.30	.70	.80	—		.58
5. Unknowns	.27	.37	.57	.39	—	.40
Grade 5 (overall $M = .39$)						
1. Effort	—					.22
2. Ability	.53	—				.48
3. Luck	.04	.50	—			.36
4. Teachers	.15	.53	.52	—		.48
5. Unknowns	.12	.35	.34	.66	—	.39
Grade 6 (overall $M = .33$)						
1. Effort	—					.80
2. Ability	.58	—				.46
3. Luck	-.19	.57	—			.43
4. Teachers	-.23	.46	.74	—		.38
5. Unknowns	.07	.19	.38	.36	—	.26

Note. Correlations are the disattenuated LISREL maximum likelihood estimates from the metric invariant model. Nonsignificant correlations, at the .05 level, are indicated by boldface. CAMI = Control, Agency, and Means-End Interview.

^aThe average is the mean intercorrelation of one subdomain with the other four subdomains. Averages were calculated using r to z transforms and then retransformed to an r metric.

gender differences. Overall mean differences appeared for each agency belief type as well as for control beliefs, with girls having higher values than boys (see Table 3 and Figure 3). These patterns of gender differences (favoring girls) on the agency and control belief dimensions were similar at each grade level, showing only a tendency for an interaction with grade level, $\chi^2(40, N = 551) = 55.16, p = .06$; this tendency is a result of slight differences in the magnitudes of the gender effect and not in the directions.

This gender effect was evaluated further by specifying a two-group MACS model (i.e., female vs. male) to estimate the disattenuated mean levels that we have presented in Figure 3. Because girls and boys did not differ in mean level regarding

means-ends beliefs (all $ps > .10$) and because the variances on each dimension were not different (all $ps > .20$), the gender effect favoring girls does not appear to be an artifact of scale usage.

In addition, girls showed higher mean levels of Academic Performance (recall that the effects of gender were estimated at the level of the indicator, thus, for math, $z = 4.09, p < .001$, and for verbal, $z = 7.36, p < .001$). Furthermore, we assessed the relation between achievement and the agency and control dimensions by partialing the effects of each in succession. When the differences in achievement were partialled from the beliefs, the gender differences disappeared. However, the converse was also true—when the differences in beliefs were partialled from achievement, the gender differences there also disappeared.

Discussion

The results of this study, when compared with those reported in the literature, show sizable similarities in school performance-related beliefs between Moscow children and children schooled in Western (American, West European) countries as well as some culture- and schooling-based modulations in these beliefs.

Cross-Cultural Similarities

Four findings supporting cross-cultural similarities emerged. First, the factor structure of the CAMI questionnaire in the Moscow sample was found to be equivalent to that reported in previous studies of Western populations of children (e.g., Oettingen et al., 1994; Skinner et al., 1988c). The threefold distinction between an agent, various means, and an end (or outcome) received further empirical support, this time stemming from the study of a non-Western population of children. The equality of the factor structure represents, simultaneously, an internal validation within the sample and an external validation in that the sample represents a new context of generalization. From a psychometric viewpoint, this finding justifies the kind of quantitative comparison necessary to test our additional hypotheses. From a theoretical viewpoint, the factorial equivalence demonstrates a similarity in the mental categories Russian and Western children apply when thinking about their own role in producing school-related outcomes (agency and control beliefs) as well as about the determining factors of school performance in general (means-ends beliefs).

Second, the general pattern of correlations between school performance-related beliefs and school achievement in Moscow was strikingly similar to previously reported correlations. That is, the sequence in predictive power between beliefs and school achievement (agency beliefs \rightarrow control beliefs \rightarrow means-ends beliefs) exactly replicated the pattern revealed in studies of Western samples of children (e.g., Chapman et al., 1990; Oettingen et al., 1994; Skinner et al., 1990). We do not know, of course, the directional causal effect of these correlations; most likely, they are reciprocal effect patterns (Sternberg & Kolligian, 1990). Of equal importance was the finding of near-zero correlations between means-ends beliefs and school performance. As with Western research, individual differences in expectations

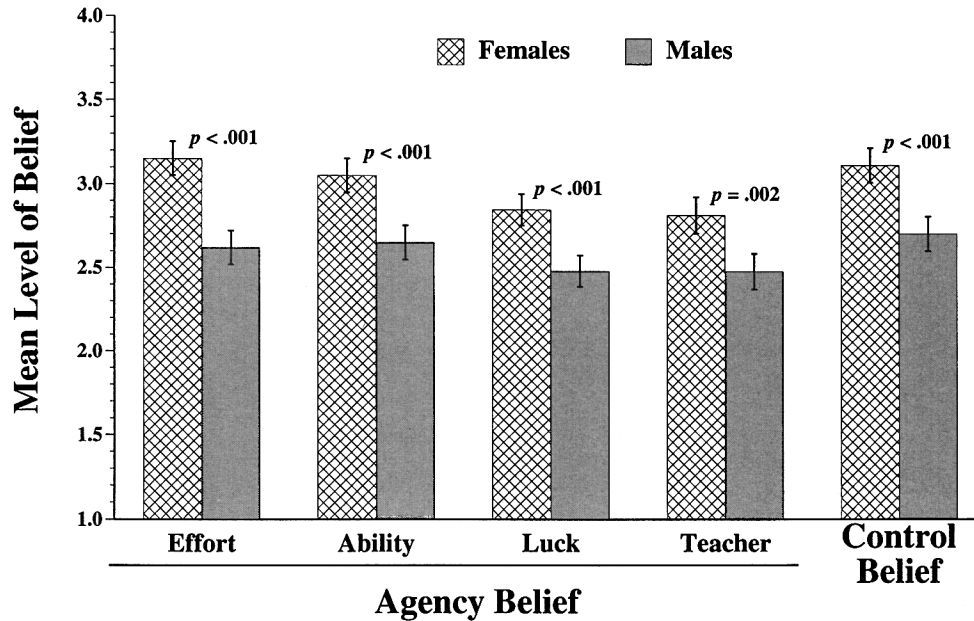


Figure 3. Disattenuated mean differences between male and female participants on the agency belief dimensions. (Error bars are the LISREL maximum likelihood estimates of the standard error.)

about what generally produces good or bad school performance did not correlate significantly with school performance.

Third, developmental trends for the agency and control dimensions across middle childhood in the Moscow sample generally replicated those reported in previous studies (e.g., Oettingen et al., 1994; Skinner & Chapman, 1987; Skinner et al., 1988a; Skinner & Connell, 1986). Specifically, across middle childhood, Moscow children did not show age-related differences in their agency beliefs nor in the amount of control they thought they could exert over school performance. In addition, the various agency beliefs (ability, effort, etc.) exhibited a high positive manifold that was invariant across the age range studied. Furthermore, Moscow children, similar to children from Western samples, generally viewed effort as the most accessible to them and luck as the least accessible with regard to achieving success or avoiding failure in school. An example of this type of configuration from data on West Berlin children (Oettingen, Lindenberger, & Baltes, 1992) is presented in Figure 4A.

For means-ends beliefs, an age-related process of differentiation was discerned, resembling findings of past research on Western children (e.g., Oettingen et al., 1994; Skinner, 1990a). Compared with younger children, older children from Moscow differentiated more between the causes leading to success and failure. This differentiation was apparent both in terms of the mean levels of the beliefs as well as the correlations among them. Regarding the configuration of means-ends beliefs, Moscow children at all sampled ages believed that effort played the most important role and that good or bad luck was the least important cause in achieving good or bad grades. Also, the role of the teachers was regarded as relatively unimportant (i.e., as the second least important cause after luck) in producing school performance. In attributing the highest values to the causal category of effort and the low-

est to the categories of luck and teacher, Moscow children converged with their Western peers, who have exhibited similar belief patterns (Figure 4B; see Skinner & Chapman, 1987; Skinner et al., 1988a).

In our general interpretations, we have emphasized the importance of the school-related environment in shaping children's beliefs; however, such an interpretation may mask the importance of maturational processes that can also affect differentiation of these beliefs. Because our findings suggest a developmental constancy, one important question for future research would be to address the universality of developmental differentiation of means-ends beliefs across a larger variety of cultural contexts.

Cross-Cultural Differences

Some indications of cross-cultural variability in performance-related beliefs were evident in comparing the results of our study and those from past research in this field. In our view and consistent with our hypotheses, such variations apply less to the foundational structure of the beliefs, but rather can be characterized as context-specific modulations. Yet, the differences are noteworthy. First, regarding agency beliefs, with age, Moscow children tended to believe less in the accessibility of the teacher in producing school performance. In previous studies, older children believed either relatively more in the accessibility of the teacher compared with younger children (see Skinner et al., 1988a) or this type of agency belief did not differ with age (Oettingen et al., 1994). In addition, children from Moscow, unlike their Western peers, generally perceived teachers rather than ability as less accessible (see Figure 4A). Notably, Moscow children viewed ability as quite accessible, nearly at the level

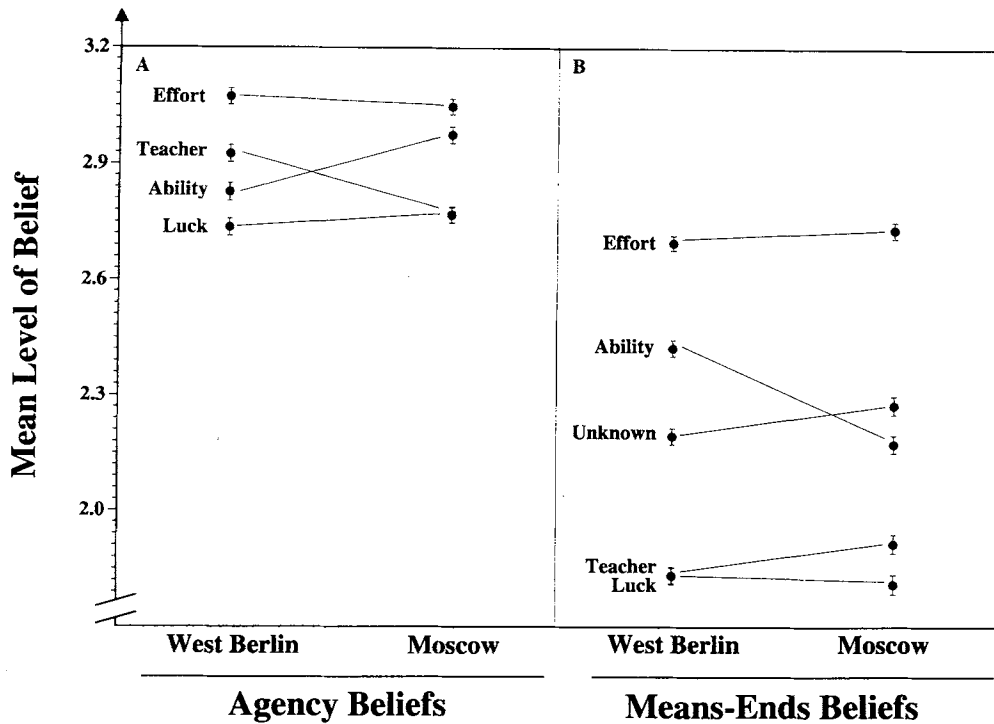


Figure 4. Comparative raw developmental trends for the agency and means-ends dimensions from samples of West Berlin and Moscow children. (West Berlin data are from Oettingen et al., 1992. Error bars are standard errors of the mean.)

of effort, whereas the West Berlin children (Figure 4A) viewed ability as much less accessible than effort.

Second, some developmental variations were also revealed in means-ends beliefs. Specifically, Moscow children systematically viewed the role of unknown causes as more important than that of their own abilities, whereas in Western samples children regarded unknown causes as generally less important than ability (Figure 4B; see Oettingen et al., 1994; Skinner & Chapman, 1987; Skinner et al., 1988a). As illustrated in Figure 4B, Moscow children clearly downplayed the role of ability in producing school-related outcomes when compared with their Western peers. In addition, Moscow children's beliefs about the role of teachers did not evince a clear developmental decrease but instead attained the same level as means-ends beliefs about ability by the sixth grade. This finding does not coincide with what has been observed in samples of children schooled in Western societies, in which the role of teachers was perceived consistently as less important than ability and these perceptions typically decreased with age.

Third, in the Moscow sample, girls showed higher mean levels than boys for each agency belief type as well as the control dimension. Such a clear-cut advantage of girls over boys has not been found in research on Western samples. On the contrary, researchers frequently report that (a) female students have lower perceptions of their competence and lower performance expectations than male students, especially in mathematics and with increasing age (e.g., Parsons, Meece, Adler, & Kaczala, 1982; Phillips & Zimmerman, 1990; Stipek, 1984; Stipek &

Gralinski, 1991), or (b) systematic gender differences have not been found (e.g., Oettingen et al., 1994).

In summary and consistent with our expectations, the major similarities in the performance-related beliefs between Moscow children and children from Western samples pertain to the basic features of school-related beliefs. These similarities were concentrated in their structure, pattern of correlations with academic achievement, main trajectories in development across middle childhood, as well as the basic configuration of means-ends beliefs. On the other hand, and again consistent with our predictions, the differences revealed in the study can be characterized as context-specific modulations in school performance-related beliefs. These differences were concentrated in the beliefs pertaining to ability and teachers as well as higher scores for girls on agency and control beliefs.

Possible Sources of the Observed Specificity of Performance-Related Beliefs in Moscow Children

In the introduction, we emphasized the possible role of school-related experiences in shaping children's beliefs in this domain. We suggested that school-related proximal factors such as commonalities in schooling formats and conceptions about school performance might contribute to similarities in children's beliefs about this domain across industrialized countries. The major outcomes of the study demonstrate sizable intercultural similarity in school performance-related beliefs of children. Notably, these similarities do not appear before schooling

but rather seem to emerge during the middle childhood era (e.g., the gradual differentiation of the beliefs). In our view, the findings are consistent with our proposals. That is, we feel that structural commonalities across the school-related environments of Russian and Western societies play a central role in shaping children's beliefs about their own school-related competence.

At the same time, we also expected that some context-specific variations in beliefs might emerge, reflecting specific features of Russian schooling. Some of these features, in our view, can be invoked to interpret the obtained differences. Generally speaking, Russian schools were predominantly collective-oriented as compared with the individual-oriented teaching practices of Western schools (e.g., Bronfenbrenner, 1970; Lawler, 1980; Makarenko, 1973; Stevenson, 1988). For example, Russian teachers would typically emphasize the interests of the collective rather than the individual, teaching students in the context of a group and with a curriculum and pace anchored to the overall group. Individual differences were taken into account to a lesser extent than in Western schooling (e.g., Polivanova, 1992; see also, multidimensional vs. unidimensional teaching formats, Rosenholtz & Rosenholtz, 1981). Moreover, teacher-student interactions in this system were unidirectional. Teachers were supposed to solely guide the process of learning, and the role of the student was to passively receive the knowledge. As a result, teachers had the status of a distanced, authoritarian "powerful other," not helpful and not cooperative with the children. To our knowledge, no Russian research has been published regarding the exact degree of authoritarianism of Russian schooling. Teacher-centered methods were traditional and rarely empirically studied (e.g., Tsukerman & Romaneeva, 1982). However, as sociologists have observed, the most common complaint of students for many years had been their lack of independence and excessive control on the part of the teachers (Kon, 1989). Furthermore, as a reaction to noncooperative, unidimensional education, a whole movement against it had been organized by so-called innovative teachers under the slogan, "Toward a Pedagogy of Cooperation." This movement manifested a substantial lack of cooperative attitudes in the learning process and growing criticism of its authoritarian style (Amonashvili et al., 1989).

We regard the teachers' status in Russian education as a plausible *a posteriori* explanation for the three findings that (a) Moscow children perceived their teachers (agency beliefs about teachers) as less accessible with age; (b) in comparison with their West Berlin peers, they perceived teachers as a relatively more important causal factor; and (c) they did not show an age-related tendency to believe less in the role of teachers (means-ends beliefs about teachers). In other words, consistent with the putatively authoritarian status of teachers in Russian schools, the children reported their teachers to be quite unaccessible but fairly important in producing school-related outcomes. The specifics of such a relationship, however, require additional information (not available to us) about the children's perceptions of teachers in Moscow schools (see, e.g., Ames, 1992; Boggiano & Katz, 1991, and Deci & Ryan, 1987, on motivational implications of teachers' expectations, controlling styles, and instructional techniques).

Another interesting variation in children's beliefs revealed in the study was that Moscow children, unlike children schooled

in Western societies, consistently downplayed the role of ability in producing school performance. Although ability was perceived as more important than the causal categories of teacher and luck, it was viewed as less important than the role of unknown causes. The possible explanation in this case could be that in conceptions about the determinants of school performance, typical of the Russian educational system, the notion of ability was rather subordinate to the notion of personal effort. In accordance with the Communist ideals of equality, students were regarded as endowed with basically equal talents (or abilities), which were not viewed as responsible for producing individual differences in achievement. These views were predominant both in Soviet educational and psychological literature (e.g., Davydov, 1986; Sukhomlinsky, 1977; Vygotsky, 1933, 1978). Because of this emphasis on equality, Moscow children perceived ability as quite accessible to them (i.e., all children possess it equally) but, at the same time, perceived the role of ability as a rather unimportant cause in producing school performance.

Finally, in contrast to previous research with Western samples, the finding that girls in Moscow had higher agency and control beliefs than boys is not easy to explain. A tempting speculation is whether this finding represents evidence for different kinds of gender-related socialization practices in Russia as compared with Western countries. Given the connection of agency and control beliefs with school grades, and assuming that girls indeed exhibit better school performance, such a relation would represent a veridical linkage; however, the origin of this linkage is enigmatic. It is interesting to note that although women in Russia traditionally do not occupy positions of the highest social status (for example, there has never been a single woman among top party officials), they do represent more than 50% of the workforce among teachers and medical doctors. This societal structure possibly explains why girls are expected to achieve highly (not less than boys, at least) in the educational context. In addition, the parents' socioculturally specific gender stereotypes may also affect the child's self-beliefs (Eccles, Jacobs, & Harold, 1990; Jacobs & Eccles, 1992). Unfortunately, because of a lack of published Russian research on this topic, we are unable to provide a more specific interpretation.

In conclusion, we may offer one general comment on the widely held belief about profound differences between Western and non-Western views of the self. The major findings of this study challenge claims that concepts like agency, self-efficacy, and a sense of personal control are restricted only to Western forms of individuality. In contrast, our results suggest that self-efficacious and agentic individuals appear even in a society that exemplifies a non-Western (collectivistic) ideology (see also Bandura, *in press*; Oettingen, *in press*). Of course, we must be cautious to not overgeneralize this finding, because more pronounced differences between Western and non-Western societies might exist in other domains of life or at other stages of individual development (Baltes, 1987). Such differences, for example, might be especially prominent when adolescence and adulthood are reached and behavioral accomplishments are at stake that exhibit conflicts between the individual and the authoritarian state. However, our study provides some supporting evidence that the generality of concepts such as agency, self-efficacy, and personal control goes beyond dichotomies of

Western versus non-Western, or individualistic versus collectivistic societies, and may instead reside in more proximal school-related causes associated with formal educational environments.

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