The proposition, derived from self-determination theory (SDT), that autonomy-support has a positive effect on self-motivation and well-being, is examined in two distinct cultural settings. Participants were 264 high school students from Russia and the United States who completed measures of perceived parental- and teacher-autonomy-support, academic motivation, and well-being. Means and covariance structure analyses were used to examine the cultural comparability of measured constructs. Results supported the hypotheses that Russian adolescents would perceive parents and teachers as more controlling than U.S. students; and in both samples, perceived autonomy-support would predict greater academic self-motivation and well-being. Results are discussed in terms of SDT's postulate of a basic human need for autonomy in the context of cultural variations.

PARENT AND TEACHER AUTONOMY-SUPPORT IN RUSSIAN AND U.S. ADOLESCENTS
Common Effects on Well-Being and Academic Motivation

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As the field of cross-cultural psychology has burgeoned, there has been an increased awareness that many concepts central to Western psychology may not be applicable within other cultures. A concept that has been treated with particular skepticism is that of autonomy. Autonomy has been considered by some theorists as a basic and universal human need, whose frustration leads to ill-being and cultural alienation (Deci & Ryan, in press; Ryan, Sheldon, Kasser, & Deci, 1996), whereas others have viewed autonomy as a culturally specific value, pertinent to Western cultures (Markus & Kitayama, 1991). Miller (1997), for example, argues that in some cultures being controlled might even be associated with greater satisfaction and adaptive outcomes.

Autonomy concerns the self-initiation or self-endorsement of one's behavior. Autonomous behavior is therefore action that one "stands behind" and views as emanating from oneself (Ryan, 1993). The opposite of autonomy is heteronomy, or having one's behavior controlled or regulated by forces outside the self. Although differences in cultural attitudes toward autonomy have been suggested by some research (e.g., Bardi & Schwartz, 1996; Schwartz & Bardi, 1997), the generalizability of the impact of experiencing supports for autonomy versus control has been surprisingly unassessed in cross-cultural studies. Presumably, if autonomy is not an important need in some cultures, then supports for autonomy should not be significant predictors of well-being or motivation within them. However, whether it is explicitly valued, if the experience of control versus autonomy-support has predictive utility, then an argument can be made for the importance of this dimension within a given cultural context.

The current research investigates the significance of perceived parental and teacher autonomy-support versus control in two distinct cultural settings: one that has traditionally been authoritarian or controlling, namely Russia; and one that has traditionally been viewed as democratic, namely the United States. Specifically, we examine whether Russian and U.S.

adolescents apply similar meanings to items tapping perceived supports for autonomy versus control and experience similar effects of autonomy-support versus control on well-being and motivation. On the basis of prior studies, we expect Russian students to report less support for autonomy by parents and teachers compared with U.S. students. Nonetheless, based upon self-determination theory (SDT; Deci & Ryan, 1985), we also expect that perceiving socializing others as being controlling rather than autonomy-supportive will have a detrimental impact upon self-motivation and well-being, even within the Russian context in which autonomy-support as a value or practice has not been traditionally emphasized (McFarland, Ageyev, & Djintcharadze, 1996).

PERCEIVED AUTONOMY, MOTIVATION, AND PSYCHOLOGICAL WELL-BEING

Autonomy, as defined within SDT, pertains to actions that are self-endorsed and based on one's integrated values or interests. In attributional terms, autonomous actions have an internal perceived locus of causality—the phenomenal sense of emanating from the self (deCharms, 1968; Ryan, 1993). By contrast, when controlled, a person experiences his/her actions as stemming from pressures, rewards, or other forces external to the self. Controlled behaviors are characterized by an external perceived locus of causality.

According to SDT, autonomy is a basic human need, and opportunities to experience autonomy are critical to well-being (Deci & Ryan, 1991; Ryan & Deci, 2000). The theory argues that people are naturally prone to self-organize action and that the sense of choice, congruence, and initiative that characterizes autonomy is a necessary aspect of healthy functioning. Environments that controllingly regulate behavior disrupt this primary propensity (deCharms, 1968), and, accordingly, have a deleterious impact on self-motivation and well-being. Specifically, controlling environments undermine intrinsic motivation (Deci, Koestner, & Ryan, 1999) and the internalization and integration regulation of extrinsically motivated behavior (Ryan et al., 1996) and are associated with more distress and less positive affect (Ryan & Deci, in press).

SDT strongly distinguishes between the concepts of autonomy and those of independence and individualism. Whereas autonomy concerns volition, independence concerns nonreliance on others. Thus, persons can be either autonomous or controlled when in a relation of dependence. Indeed, empirical work has shown that autonomy and independence can be distinguished both conceptually and operationally (Ryan & Lynch, 1989), and, if anything, a willingness to depend on significant others is typically facilitated by the perception that those others are autonomy-supportive (e.g., Ryan, Stiller, & Lynch, 1994). Similarly, whereas some authors equate autonomy with individualism (e.g., Cross & Markus, 1999), SDT suggests that one can be autonomously collectivistic or autonomously individualistic. One who truly endorses collectivistic values could be highly autonomous when acting in accord with them (Ryan & LaGuardia, in press). Alternatively, one may act in a collectivist way because of controlling or coercive influences, which according to SDT, would result in lower well-being and self-motivation.

Autonomy in schools. As the nature of autonomy has been clarified, a growing body of research has attested to the robust effects of autonomy-support versus control in many domains of activity, including health care (Williams, Grow, Freedman, Ryan, & Deci, 1996; Williams, Rodin, Ryan, Grolnick, & Deci, 1998), environmentalism (Pelletier, Tuson, Green-Demers, Noels, & Beaton, 1998), religion (Ryan, Rigby, & King, 1993), work (Deci,

Connell, & Ryan, 1989), and sport (Frederick & Ryan, 1995; Goudas & Biddle, 1994). Specifically, perceiving others as controlling one's behavior has been shown to have a markedly negative affect on self-motivation and persistence, as well as well-being within these spheres of activity (Ryan & Deci, 2000).

More pertinent to the current study are the effects of parent and teacher autonomy-support versus control on students' well-being and academic motivation. A great deal of research, mostly based in North America (Deci, Schwartz, Scheinman, & Ryan, 1981; Ginsburg & Bronstein, 1993; Grolnick, Ryan, & Deci, 1997; Ryan & Grolnick, 1986; Vallerand, 1997), reveals positive relations between parents' and teachers' autonomy-support and students' intrinsic and autonomous self-motivation in school, self-esteem, and perceived competence. These findings have been obtained on all levels of schooling including elementary (e.g. Grolnick & Ryan, 1989), high school (e. g., Vallerand, Fortier, & Guay, 1997), college (e.g., Black & Deci, in press) and postgraduate education (Williams & Deci, 1996). Although these effects have been explored in numerous studies (Ryan & LaGuardia, 1999), they have not been explored in a country that is more authoritarian in its traditional orientation.

WHY RUSSIA?: AUTONOMY AS A CULTURALLY SPECIFIC VERSUS UNIVERSAL CONCERN

Several prominent theorists have questioned how generalizable across cultures the SDT perspective on autonomy versus control is. For example, Cross and Markus (1999) depicted SDT as a Western agentic view, and Miller (1997) argued that in many non-Western nations, being externally controlled is culturally normative and may not have the negative impacts detected in the West. In part, such claims are supported by evidence that cultures vary greatly in their explicit valuing of autonomy, self-direction, egalitarianism, and conformity (Schwartz, 1994).

Yet, the claim that autonomy constructs do not apply outside the West can itself be questioned. First, as discussed before, the concept of autonomy is often confused with issues of separation, detachment, and independence, which are cultural concerns distinct from that of autonomy. Secondly, in the SDT view, the issue of autonomy reflects mainly how well an individual has integrated cultural values so that they become truly self-endorsed (Ryan & Connell, 1989; Ryan et al., 1996). Poorer integration of ambient regulations and values, whether Eastern or Western, individualistic or collectivistic, is thus, in the SDT view, indicative of lower autonomy. From this perspective, the issue of how willingly a person enacts cultural practices is relevant within all cultural contexts. Third, between-culture differences in mean levels of the value for autonomy do not preclude similarities in the functional impact of autonomy-supportive versus controlling environments, and that is one of the issues addressed in the current study. Finally, although it is claimed that autonomy versus control is largely a Western concern, to date there is little evidence either way. Studies in Japan have suggested that children with lower autonomous motivation for schools exhibit adjustment problems and negative achievement-related attitudes that are similar to those manifest in U.S. students (e.g. Hayamizu, 1997; Yamauchi & Tanaka, 1998), and that similar to U.S. children, Japanese students who experience controlling environments display lower intrinsic motivation (Kage, 1991). However, evidence from other non-Western, and in particular, more authoritarian, cultures concerning these issues has not yet emerged. That is, the functional effects of perceived autonomy have not been widely tested cross-culturally.

Russia was chosen for this research because it is traditionally viewed as a relatively authoritarian culture. Starting with the work of Mead (1955) and Gorer (1962), researchers

have consistently associated the Russian national character with more-controlling child-rearing practices. For example, Ispa (1995) argues that "traditional Soviet pedagogy held to child-rearing methods designed to foster values consistent with the demands of citizenship in a totalitarian socialistic society. These values included loyalty, obedience, group-minded-ness, and conformity" (p. 362). Other recent studies show that despite some changes in tradi-tional attitudes, the authoritarian beliefs of Russian citizens remain relatively high (McFarland, Ageyev, & Abalakina-Paap, 1992; McFarland et al., 1996). Research con-ducted in other Eastern European countries, which were similarly governed by communist regimes for decades, also reveals that high importance is placed on hierarchical authority with less emphasis being placed on egalitarianism, intellectual and affective autonomy, and mastery values (Deci, et al., in press; Schwartz & Bardi, 1997).

If we assume that Russians have been acculturated to live within a relatively controlling environment, then we can expect that they would not have a strong need for autonomy-supports and that the experience of being controlled would be a culturally congruent experi-ence that would not cause negative effects on well-being. Such findings would support a cul-tural relativism perspective and would contradict SDT, which posits that the need for autonomy is universal. But, if despite its traditional authoritarianism, Russian adolescents show positive outcomes of perceived autonomy-support, then the idea that autonomy is a general human need will be more plausible. Thus, although we predict that the level of per-ceived autonomy-support of teachers and parents will be lower in Russia, we expect negative effects of control versus autonomy-support on students' well-being and academic self-motivation in both U.S. and Russian contexts.

An important focus of our analyses concerns whether our measures of autonomy-support versus control and of student motivation have similar meanings cross-culturally. To address this we explicitly compare participants' responses to our measures using mean and covariance structure (MACS) (Little, 1997) with LISREL (Joreskog & Sorbom, 1993). MACS is an extension of structural equation modeling (SEM), which directly tests the mea-surement equivalence of constructs, by examining both latent means and covariance struc-tures of self-report assessments. It thus provides a powerful basis for determining the simi-larities and differences of a measure's properties in different groups.

WELL-BEING: EXAMINING THE CROSS-CULTURAL GENERALIZABILITY OF CONSTRUCTS

Just as theorists have questioned whether psychological needs generalize across cultures, some have also questioned whether measures of well-being have similar meanings in differ-ing cultural contexts (Peplau, Veniegas, Taylor, & Debro, 1999). In the present study, we sub-ject our well-being measures to an evaluation of their equivalence using MACS analyses. In a prior study of Russian and U.S. college students, Ryan, et al., (1999) showed that the well-being measures used in the current study (i.e., indices of depression, self-actualization, self-esteem, and life satisfaction) held up to stringent cross-cultural equivalency criteria. We thus expect that these measures will be appropriate for this comparison, as well.

SUMMARY

We assess perceived supports for autonomy in adolescents from two diverse cultures. We examine whether students in both samples construe the construct of autonomy-support and control by parents and teachers in equivalent ways; we compare mean levels of autonomy-

support versus control; and we investigate the within-culture effects of these constructs on well-being and school motivation. We specifically expect that students' well-being will be lower in Russia, perceived parent and teacher autonomy-support versus control will be lower in Russian than U.S. students, and perceived autonomy-support from parents and teachers will be associated in both samples with greater well-being and internalization of values and interests for school.

METHOD

PARTICIPANTS

The total sample consists of 236 students; 43 boys and 77 girls from Russia, and 49 boys and 67 girls from the United States. Russian students ranged from 14 to 17 years old (mean = 16.13 years), and U.S. students ranged from 16 to 19 years old (mean = 17.10 years). Both Russian and U.S. participants were drawn from high school grade levels, and all participated on a wholly volunteer basis. No compensation was offered. The Russian school was located in the city of Yarslovl, and the U.S. sample came from Rochester, NY. Selection of the schools in the both of these midsize, northern cities was dictated by the intention to make the samples as comparable as possible.

MEASURES AND PROCEDURE

All questionnaires were translated from English to Russian by a Russian psychologist fluent in English. Back-translations were done by a bilingual (Russian/English) specialist in linguistics. Independent judges then considered the equivalence of the original and back-translated version of the scales and measures, and final editing of the translated versions were done by the Russian psychologist together with a U.S. psychologist after discussing any nonequivalence detected by the judges. By these procedures we attempted to maximize the linguistic equivalence of our measures (Brislin, 1986), but this equivalence was further tested statistically (see below), and the measurement invariance of constructs examined.

Demographic variables. Participants reported their family's monthly (for Russians) and annual (for U.S. students) income, using 9-point ordinal-response categories, which covered the range of possible incomes. Participants also provided data on their parents' educational attainment and job status. These demographic variables were used as within-country control variables.

Perceptions of Parental Autonomy-Support and Control Questionnaire (PAS; Robbins, 1994). This scale consists of 12 items, assessed on 9-point Likert-type scales. Four items tap *Parental Controllingness* (e.g., "My parents try to tell me how to run my life"). Cronbach's alpha was .86 for the U.S. students and .79 for the Russians. Another 8 items assessed perceived *Parental Autonomy-Support*, (e.g., "My parents help me to choose my own direction"). Alpha for this subscale was .85 for the American students and .82 for the Russian students.

Perceptions of Teachers' Autonomy-Support and Control Questionnaire (TAS). To provide a conceptually similar scale to the PAS, a parallel teacher measure was created consist-

ing of a 4-item *Teacher Control* subscale, and an 8-item *Teacher Autonomy-Support* subscale, rated on the same 9-point Likert-type scales. The alphas for controllingness and autonomy-support were .71 and .77 for the Russians and .63 and .87 for U.S. students, respectively. Both Parent and Teacher Autonomy-Support Subscales were split into two 4-item unidimensional parcels (Kishton & Widaman, 1994) and, together with controlling subscales, used for the measurement of corresponding latent constructs.

Self-Regulation Questionnaire-Academic Domain (SRQ-A; Ryan & Connell, 1989). The SRQ-A consists of 12 items that measure students' reasons for doing school work along a dimension from little or no volition to very high volition. Specifically, the SRQ-A assesses four types of reasons for academic work: *external* regulation, motivation based on external pressures/rewards (e.g., "Because I will get in trouble if I don't"); *introjected* regulation, motivation based on internal pressures, anxiety, guilt, self-approval (e.g., "Because I would be ashamed of myself if I didn't); *identified* regulation, motivation based in perceived value and worth of school (e.g., "Because I think school work is important); and *intrinsic* motivation, motivation based in fun and enjoyment of school work (e.g., "Because it is interesting to me"). The SRQ-A has been used widely and has been adapted and applied to differing age levels and different cultures, including North America (Ryan, 1995; Vallerand, 1997) and Japan (Yamauchi & Tanaka, 1998).

Psychological well-being. Well-being was assessed with four widely used and well-validated scales: (a) the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965), which assesses the global feeling of self-worth; (b) the 20-item Center for Epidemiological Studies-Depression Inventory (CES-D; Radloff, 1977), which assesses depressive symptoms; (c) the 15-item Short Index of Self-Actualization (Jones & Crandal, 1986), which measures one's orientation toward self-acceptance, self-realization, and intimate relationships (Tuckere & Weber, 1988); and (d) the 5-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), which measures the judgmental component of subjective well-being. As will be reported subsequently, our analyses investigate (and support) the cross-culturally equivalence and applicability of these measures, at least for these Russian and U.S. adolescent samples (see also Ryan et. al, 1999).

STRATEGY FOR STATISTICAL ANALYSIS

The analysis of data consists of two parts. First, we test for the construct comparability, or measurement equivalence, of our central constructs concerning perceived autonomy-support, well-being, and academic self-regulation. Establishing the measurement of equivalence of these constructs allows us to evaluate their latent level means, variances, and intercorrelations. Second, we test our hypotheses using error-free and reliable latent construct parameters.

Testing of construct comparability is considered a fundamentally important aspect of empirically based cross-cultural research (Poortinga, 1989; Vijver & Leung, 1997). Although there are several approaches to measurement-equivalence testing that can be utilized in cross-cultural research (Byrne & Campbell, 1999; Cheung & Rensvold, 2000; Reise, Wideman, & Pugh, 1993; Vijver & Leung, 1997), we use MACS analyses, which are well-suited for this purpose (Grob, Wearing, Little, & Wanner, 1996; Little, 1997, 2000; Little, Oettingen, Stetsenko, & Baltes, 1995; Ryan et al., 1999). Specifically, in addition to general psychometric advantages (e.g., attenuation, explicit estimation of the indicator error terms),

this procedure allows us to: (a) simultaneously test and validate the hypothesized factorial structure in each group (i.e., the pattern of indicator-to-construct relations that include both intercepts and factor loadings); (b) evaluate cross-group measurement equivalence by placing between-group equality constraints on intercepts and factor loadings in measurement models; (c) detect between-group differences in latent constructs' means, variances, and intercorrelations, and; (d) test hypotheses about cultural differences in the relations between constructs. This approach also accounts to a large extent for the extreme response style (ERS) and acquiescent response style (ARS) that may occur in cross-cultural measurements (Little, 1997, 2000). Because the procedure of MACS analyses has been described elsewhere (Little, 1997; Ryan et al., 1999) we present only the results of construct comparability testing. Analyses of the latent construct parameters and the testing of hypotheses are presented in the Results section.

Testing construct comparability. To fulfill the requirement of multiple indicators' strategy for SEM modeling, each latent construct (except the self-regulation variables) was represented by a set of parcels (i.e., aggregated measured items; Kishton & Widaman, 1994). We used two or three parcels depending on the number of items in a particular questionnaire. Four types of Self-Regulation in Academic Domain were represented by three measured items each. To test the measurement invariance, we used a set of three nested models with different constraints on their measured parameters. In the first model, we simultaneously freely estimated the measurement parameters in both groups. These estimated measurement parameters included factor loadings, error variances, and covariance between constructs. In the second model, we constrained the factor loadings to be equal across groups and allowed the error variances and covariance to be freely estimated. This model represented factorial invariance. The third model with strong factorial invariance included the equality constraints imposed on both intercepts and factor loadings. At every step of this procedure we evaluated the fit of these models and the difference of their relative fit in comparison to the less restricted model.[1]

Because of the relatively small sample sizes in this study, we tested the invariance of measurement models for independent and dependent variables differently. Models for the Parents' and Teachers' Autonomy-Support constructs, well-being indicators, and the four types of self-regulation demonstrated acceptable fit. Specifically, the fit of the model for autonomy-support with a strong factorial invariance was acceptable: χ^2 ($df = 26$; $N = 236$) $= 41.76$, $p < .03$, GFI = .96, IFI = .97, CFI = .97, RMSEA = .05; and the differences in fit from the freely estimated model were not sufficient to conclude that the equality constraints on the loadings and intercepts of the observed indicators across two samples substantially deteriorate the approximation of the data, (χ^2 [10,236] $= 28.05$, $p < .01$, GFI = .02, IFI = .03, CFI = .03, RMSEA = .04). The fit of the model with the equality constrained on the intercepts and factor loadings for well-being indicators was also acceptable, (χ^2 [$df = 74$, $N = 236$] $= 151$, $p < .001$, GFI = .91, IFI = .93, CFI = .93, RMSEA = .07); and the difference from the model with no constraints was relatively small (χ^2 [$df = 16$, $N = 236$] $= 79.6$, $p = .001$, GFI = .04, IFI = .06, CFI = .06, RMSEA = .04). The fit of the model with strong factorial invariance for the self-regulation variables was adequate (χ^2 [$df = 111$, $N = 236$] $= 187.2$, $p < .001$, GFI = .90, IFI = .90, CFI = .90, and RMSEA = .05); and the differences in fit with the model with no equality constraints were negligible (χ^2 [$df = 13$, $N = 236$] $= 29.95$, $p < .01$, GFI = 0.0, IFI = .02, CFI = .02, RMSEA = .01). Because all three models were based on a solid theoretical bases, rooted in SDT; showed acceptable fit statistics; and the differences in fit between the invariant and the noninvariant models were negligible, we concluded that all 10 latent

constructs were comparable across two groups. According to Little (2000), the construct comparability or measurement equivalence means that constructs are defined in the same operational manner in each cultural group, that they generalizable to each cultural context studied, that cultural differences have not differentially affected the constructs underlying measurement characteristics, and that between-culture differences in the constructs' means, variances, and correlations are quantitative in nature and can be compared meaningfully.

RESULTS

Because no significant gender differences were found in either sample on the central variables, data were collapsed across gender. The latent construct comparisons of means and variances are shown in Table 1. Russians are lower on most of the latent constructs relative to their U.S. counterparts. As predicted, they see their social context as less autonomy-supportive (t for Parents' Autonomy-Support (PAS) is –2.97, $p < .01$, and for Teachers' Autonomy-Support (TAS) is –4.18, $p < .001$). Russian students also evidenced lower self-actualization ($t = -6.59, p < .001$), self-esteem ($t = -3.15, p < .01$), and life satisfaction ($t = -4.21, p < .001$) relative to U.S. students. With regard to academic self regulatory styles, there were no differences between external regulation in two samples. Russians were lower on two forms of internalized extrinsic regulation: introjected regulation ($t = -2.97, p < .01$) and identified regulation ($t = -2.21, p < .05$). However, they reported greater intrinsic motivation ($t = 3.54, p < .001$) than the U.S. participants.

Tables 2 and 3 depicted attenuated intercorrelations between the measured latent constructs. In Table 2, intercorrelations between the autonomy-support constructs and the indicators of well-being are presented. In both countries, PAS is positively related with most of the well-being indicators, except for depression in the U.S. sample. PAS is more strongly related to well-being indicators than TAS, which is more mildly associated with well-being outcomes. Only 4 of 15 pairs of correlations had significant difference in effect size. Specifically, negative correlation between PAS and depression was higher in the Russian sample (–.09 and –.48, $p < .001$), whereas the correlation between TAS and depression was higher in the U.S. sample (–.14 and .08, $p < .05$). Correlations between self-actualization and self-esteem (.57 and .85, $p < .001$) and between self-actualization and life satisfaction (.25 and .37, $p < .05$) were higher in the Russian sample.

There is a practically identical pattern of correlations between the well-being indicators in both samples. Specifically, all indicators of well-being have positive intercorrelations with each other and negative correlations with depression. This pattern suggested the viability of a higher order factor for well-being (WB) that accounts for these covariances. The simultaneous run of a two-group comparison with all parameters demonstrated a good fit (χ^2 [$df = 63, N = 236] = 79.50, p = .078$, RMSEA = .033, GFI = .95, CFI = .98, IFI = .99). When the factor loadings and the intercepts for the first- and second-order factor structures were constrained to be equal, and error variances for both indicators and first-order factors were assigned to be different across the two samples, the fit of the model was still acceptable (χ^2 [$df = 62, N = 236] = 139.4, p < .001$, RMSEA = .10 [90% CI, .07-.13], GFI = .92, CFI = .93, IFI = .93. The difference in chi-square between the two models is significant, but the relative fit indices for the invariant model were acceptable, suggesting that the higher order factor structure is, indeed, invariant across two samples. The mean and variance for WB for the Russian versus U.S. samples are –.22 ($t = -3.68, p < .001$) and .89 ($t = 2.97, p < .01$). We use this WB indicator in all subsequent analyses.

TABLE 1
Estimated Latent Constructs' Means and Variances
for the U.S. (*n* = 116) and Russian (*n* = 120) Samples

Latent Construct	United States		Russia		Means Difference Test	
	Mean	Variance	Mean	Variance	t	p
PAS	0.0	1.00	−.41	.90	−2.97	< .01
TAS	0.0	1.00	−.54	.71	−4.18	< .001
Self-actualization	0.0	1.00	−1.27	.48	−6.59	< .001
Self-esteem	0.0	1.00	−.42	.81	−3.15	< .01
Depression	0.0	1.00	−.25	.85	1.93	< .10
Life satisfaction	0.0	1.00	−.57	.79	−4.21	< .001
External regulation	0.0	1.00	.10	.93	ns	
Introjected regulation	0.0	1.00	−.39	.55	−2.97	< .01
Identified regulation	0.0	1.00	−.35	.95	−2.21	< .05
Intrinsic motivation	0.0	1.00	.53	.96	3.54	< .01

NOTE: PAS = Parental Autonomy-Support, TAS = Teacher Autonomy-Support, ns = not significant.

TABLE 2
Estimated Attenuated Correlations Between Latent Constructs of PAS, TAS,
and Well-Being Indicators for U.S. (*n* = 116) and Russian (*n* = 120) Students.

	PAS	TAS	SA	SE	D	LS
PAS	—	.23*	.35**	.40**	−.09	.49**
TAS	.26*	—	.33**	.18	−.14	.34**
SA	.39**	.20*	—	.57**	−.47**	.25*
SE	.54**	.21*	.85**	—	−.64**	.69**
D	−.48**	.08	−.60**	−.65**	—	−.50**
LS	.50**	.36**	.37*	.60**	−.40**	—

NOTE: U.S. data are in the upper triangle. PAS = Parental Autonomy-Support, TAS = Teacher Autonomy-Support, SA = self-actualization, SE = self-esteem, D = depression, LS = life satisfaction.

In Table 3, the correlations between the autonomy-support indicators and the four types of academic self-regulation are presented. The relations between PAS and TAS with academic regulation are similar in both samples. Specifically, both PAS and TAS negatively relate to external regulation (EX), have no relations to introjected regulation (IJ), and positively relate to both identified regulation (ID) and intrinsic motivation (IM) in both samples. It is also evident that TAS has a stronger influence on students' IM in both samples. There are no differences between the correlations that reflect the association between independent and dependent variables in this model. However, there are some differences in the pattern of correlations between self-regulation indicators between Russian and U.S. samples. The biggest differences can be observed in the correlations of EX with other types of regulation. Specifically, in the U.S. sample, this type of regulation had no relation with IJ and was negatively correlated with ID and IM. In the Russian sample, EX was related positively with IJ and was not significantly related to ID and IM. These different patterns suggest that although there is a measurement invariance of the scale that measures self-regulation in academic domain, the

TABLE 3
Estimated Attenuated Correlations Between Latent Constructs of PAS,
TAS, and Self-Regulation Indicators for U.S. and Russian Students

	PAS	TAS	EX	IJ	ID	IM
PAS	—	.23*	–.21*	.06	.38**	.14
TAS	.26*	—	–.25*	.03	.36**	.60**
EX	–.26*	–.28*	—	–.05	–.37**	–.26*
IJ	.15	.08	.70**	—	.38**	.22*
ID	.47**	.43**	.02	.39**	—	.36**
IM	.16	.48**	–.06	.40**	.74**	—

NOTE: U.S. data are in the upper triangle. PAS = Parental Autonomy-Support, TAS = Teacher Autonomy-Support, EX = external regulation, IJ = introjection, ID = identification, IM = intrinsic motivation.

relations between the latent constructs within the scale are different in these two distinct groups.[2]

Invariant estimated factor loadings, intercepts, and error variances (different for two samples) are presented in Table 4.

STRUCTURAL EQUATION MODEL TESTING OF HYPOTHESES

Because all of the scales used in this research were factorially invariant across U.S. and Russian students, the issue of relations between the latent constructs could be directly addressed. The first model to be analyzed concerned our hypothesis that PAS and TAS would predict WB in both cultures. PAS and TAS were two independent latent variables with three indicators each. Two indicators of PAS were constrained to be correlated in both samples. WB was a dependent latent variable with four indicators. Two paths lead from PAS and TAS to WB. To provide a metric for the latent variables (LVs), one of the indicators loading for each variable was set to 1.00. Maximum likelihood estimation was used to generate standardized parameter estimates because it is robust in dealing with deviations from multivariate normality (Huba & Harlow, 1987).

Model 1. The simultaneous regression analyses with the latent variable were done in two groups, with intercepts and factor loadings in the measurement models of the independent variables and loadings in the measurement model of the dependent variable constructed to be equal; and the error variances for the observed variables, the error variances of WB, and variances of PAS and TAS and the intercepts and regression coefficients in the regression equations were assigned to be different in both samples. The independence model that tests the hypothesis that all variables are uncorrelated was easily rejectable, (χ^2 [df = 90, N = 236] = 902.92, p<.00001). The hypothesized model was tested next, and marginal support for it was found (χ^2 [df = 77, N = 236] = 208.84, p < .00001, CFI = .84). This result shows improvement in fit between the independence model and the hypothesized model. The GFI of .92 shows that more than 90% of the variances and covariances in observed matrix are predicted by the hypothesized model. The other results, RMSEA = .086 and standardized RMR = .07, were also acceptable. The nested model, with regressions assigned to be parallel and intercepts to be different, was tested next. The fit of the model did not change: χ^2 = .43, df = 2, not significant with all other indices being the same. This result means that the slopes of the regressions

TABLE 4
Parameter Estimates for the Measurement Models for U.S. and
Russian Samples (Common Metric Completely Standardized Solution)

	Factor Loadings							Error Variance		
Observed variable	PAS	TAS	Well-Being	EX	IJ	ID	IM	American	Russian	Intercept
Parents' AS-1	.82	0	0	0	0	0	0	.40	.26	15.3
Parents' AS-2	.86	0	0	0	0	0	0	.21	.32	15.0
Parents' control	–.59	0	0	0	0	0	0	.78	.53	9.9
Teachers' AS-1	0	.91	0	0	0	0	0	.14	.19	13.2
Teachers' AS-2	0	.79	0	0	0	0	0	.42	.35	12.3
Teachers control	0	–.47	0	0	0	0	0	.66	.90	11.1
Self-actualization	0	0	.48	0	0	0	0	1.19	.36	50.3
Self-esteem	0	0	.89	0	0	0	0	.21	.21	39.2
Depression	0	0	–.56	0	0	0	0	.77	.61	48.4
Life satisfaction	0	0	.61	0	0	0	0	.65	.60	16.0
EX-1	0	0	0	.64	0	0	0	.53	.64	2.9
EX-2	0	0	0	.62	0	0	0	.61	.63	2.4
EX-3	0	0	0	.68	0	0	0	.49	.57	3.2
IJ-1	0	0	0	0	.61	0	0	.52	.73	2.9
IJ-2	0	0	0	0	.68	0	0	.49	.58	2.6
IJ-3	0	0	0	0	.62	0	0	.44	.79	2.8
ID-1	0	0	0	0	0	.53	0	.54	.89	4.5
ID-2	0	0	0	0	0	.72	0	.41	.55	4.0
ID-3	0	0	0	0	0	.66	0	.38	.75	4.1
IM-1	0	0	0	0	0	0	.70	.39	.62	2.6
IM-2	0	0	0	0	0	0	.79	.37	.39	2.3
IM-3	0	0	0	0	0	0	.78	.24	.53	2.3

NOTE: PAS = Parents' Autonomy-Support, TAS = Teachers' Autonomy-Support, AS = autonomy-support, EX = external regulation, IJ = introjected regulation, ID = identified regulation, IM = intrinsic motivation.

of WB on PAS and TAS are parallel in U.S. and Russian samples. PAS had a significant effect on WB in both samples: standardized coefficient = .39, $p < .01$. TAS did not have a significant effect on WB within the model. In accordance with the general hypotheses, perceived autonomy-support in one's social context positively predicted WB, accounting for nearly 50% of the variance in both groups. These results are depicted in Figure 1.

Model 2. The SEM includes two independent LVs representing PAS and TAS, each measured by three indicators, and four dependent LVs reflecting academic self-regulation (EX, IJ, ID, and IM), each measured by three indicators. These measurement models were set to be equal across samples. First, the simultaneous regression analysis with the latent variable was done in two groups in which intercepts and factor loadings in the measurement models were assigned to be equal. The error variances of the observed variables, the error variances
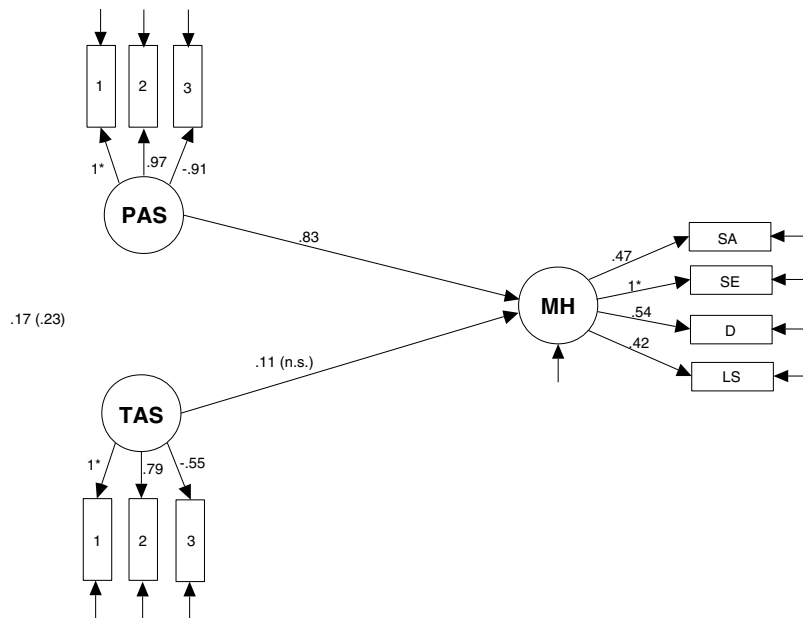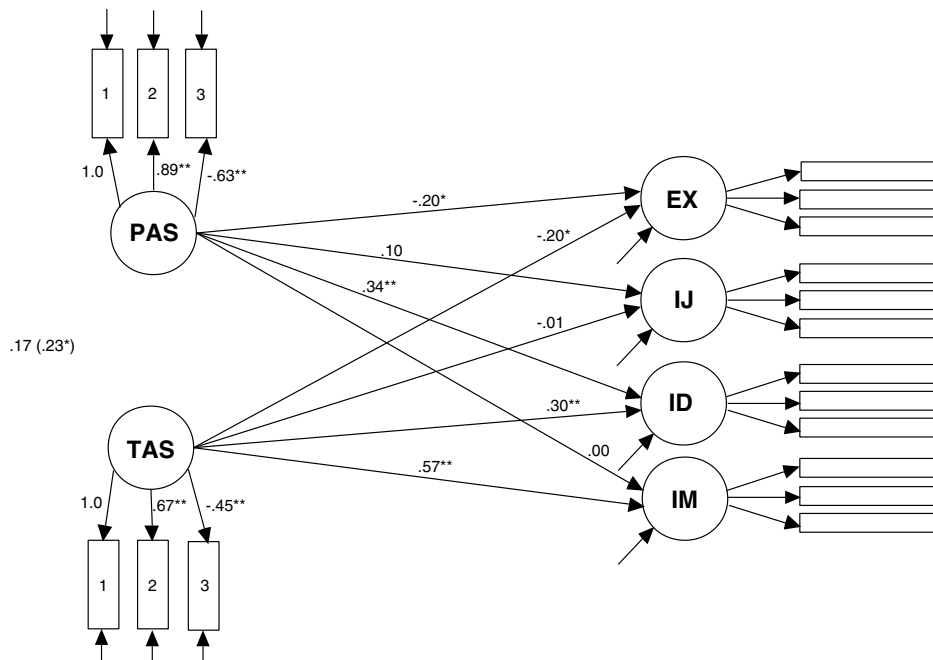
Figure 1:   Structural equation model of perceived autonomy-support predicting well-being variable in U.S. and Russian samples.

NOTE: (χ^2 [74, N = 236] = 137.5, p < .001, GFI = .91, CFI = .92, IFI = .92, RMSEA = .06). PAS = Parental Autonomy-Support, TAS = Teacher Autonomy-Support, WB = well-being, SA = self-actualization, SE = self-esteem, D = depression, LS = life-satisfaction; 1, 2, 3 are observed variables for autonomy-support scales. All parameter estimates (standardized are significant at p < .01. Loadings and regression coefficients are equal across two samples. Correlations in parentheses are for Russian students.

of the self-regulation variables, the variances of PAS and TAS, and the intercepts and regression coefficients in the regression equations were assigned to be different in both samples.

The independence model that tests the hypothesis that all variables are uncorrelated was easily rejectable, (χ^2 [df = 306, N = 236] = 1767.88, p < .00001). The hypothesized model was tested next, and marginal support for it was found, (χ^2 [df = 276, N = 236] = 495.67, p < .00001, CFI = .91). This data shows improvement in fit between the independence model and the hypothesized model. The GFI (.85) shows that more than 80% of the variances and covariances in observed matrix are predicted by the hypothesized model; RMSEA = .045 is also acceptable. The nested model with regressions assigned to be parallel and intercepts to be different was tested next. The fit of the model did not change (χ^2 = 8.03, df = 8, p < .30) with all other indices the same. This result means that the slopes of the regressions of self-regulation variables on PAS and TAS are parallel in U.S. and Russian samples. PAS had a significant negative effect on EX and a positive effect on ID regulation in both samples: (standardized coefficients are –.19, p < .01 and .34, p < .01). TAS had positive effects on ID and IM (standardized coefficients are .30 and .57, respectively, both p < .01), and a negative effect on EX (–.19, p < .01). TAS was the strongest predictor of academic regulation in both samples, accounting for nearly 40% of the variance in the DVs. PAS was less predictive but still explained nearly 20% of the variances. The results of this analysis are presented in Figure 2.

**Figure 2:   Structural equation model of perceived autonomy-support predicting types of academic motiva-
tion in U.S. and Russian samples.**
NOTE: (χ^2 [280, N = 236] = 409.93, p < .001, GFI = .85, CFI = .91, IFI = .91, RMSEA = .065). PAS = Parental
Autonomy-Support, TAS = Teacher Autonomy-Support, EX = external regulation, IJ = introjected regulation, ID =
identified regulation, IM = intrinsic motivation; 1, 2, and 3 are observed variables for autonomy-support scales.
Parameter estimates are standardized. Factor loadings and regression coefficients are equal across samples. Corre-
lations in parentheses are for Russians.
*p < .05; **p < .01.

DISCUSSION

There are still many debates about the relations between human nature and culture.
According to purer social constructivist or cultural relativist viewpoints, culture is the pri-
mary source of psychological attributes, values, attitudes, and motives. These perspectives
assume that human nature is docile and therefore derived from, and reflective of, ambient
cultural practices and values. An alternative point of view emphasizes the interaction
between evolved, universal aspects of human nature and ambient cultural influences (Tooby
& Cosmides, 1992). SDT is one theory that embraces the latter view (Deci & Ryan, in press;
Ryan & Deci, 2000), arguing that basic psychological needs for autonomy, competence, and
relatedness can be identified across all cultures and that these basic needs interact with social
contexts to produce variations in human behavior, cultural styles, and well-being. Although
there has been little argument concerning the cross-cultural relevance of relatedness and
competence needs, the idea that there is a basic need for autonomy remains highly controver-
sial. That is, many theorists (e.g., Cross & Markus, 1999; Miller, 1997) assume that auton-
omy represents a Western, individualistic value, and therefore is not a basic need that has
general relevance or functional significance across cultures.

The focus of this investigation was to assess the relevance of perceived autonomy-support
versus control in two different cultural contexts. According to SDT, when a person perceives

significant others as supporting their autonomy (versus being controlling), they exhibit both greater well-being and greater self-motivation with respect to ambient values. Russia supplied an interesting locus for such a cross-cultural test because it is traditionally considered to be authoritarian (McFarland et al., 1996) and at least moderately collectivistic (Triandis, 1995) and thus stands in contrast to the United States in both regards. In line with SDT, we predicted that Russian adolescents would give meaning to autonomy-support versus control constructs similar to their U.S. counterparts, and furthermore, that perceiving greater autonomy-support from parents and teachers would be associated with greater well-being and more autonomous motivation in both samples.

Our findings generally supported both hypotheses. First, the analysis of construct comparability of autonomy-support of parents and teachers showed that these constructs were interpreted similarly by both Russian and U.S. students. The same methodology was also used to show the comparability of the indicators of well-being we employed, and our motivational constructs, namely, external, introjected, identified and intrinsic motivations. Mean comparisons, based on the strong factorial invariance of these constructs, confirmed the expected lower level of autonomy-support and well-being in Russian participants. Lower levels of well-being have been found in some previous research (Grob et al., 1996). For example, Ryan et al. (1999) found lower levels of self-actualization and self-esteem and higher levels of anxiety among Russian college students compared with U.S. students in similar settings. The lower levels of perceived autonomy-support and higher levels of perceived controllingness by parents and teachers had not been previously examined, but these findings fit with a number of prior ethnographic studies (e.g., Ispa, 1995).

Despite these expected mean-level differences, relations between perceived autonomy-support and well-being and school motivation were evident, as predicted by SDT. Greater parental autonomy-support predicted greater adolescent well-being in both samples. Also in both samples, both teacher and parent autonomy-support affected academic self-regulation, and were associated with more integrated and/or intrinsic motivation in school. Thus, our hypotheses, based on the view that autonomy is a universal psychological need, received support from these findings.

An interesting pattern in the results also suggested that in both samples, parental autonomy-support had a greater influence on adolescents' general well-being than did such support from teachers, consistent with earlier work on parent and teacher influences on U.S. adolescents' well-being (Ryan et al., 1994). However, both parents and teachers influenced school motivation. Teacher autonomy-support was linked in both samples with students' intrinsic motivation and identification with school-related goals, whereas parental autonomy-support was linked with identification, but not intrinsic motivation. Thus when it comes to developing a value for school, both parents and teachers may be an important influence, but it is teachers who appear to more greatly affect students' experiences of interest and challenge in the academic domain. Mean differences between samples also suggested that whereas there were no differences in reported external regulation, Russians reported greater intrinsic motivation for school than did their U.S counterparts. However, U.S. students were higher on both identification and introjection, that is both internalized forms of motivation, than were the Russian students.

The current research has some notable limitations. First, we examined only adolescent samples drawn from single high schools. Generalization of this pattern of findings to other age groups, to other subcultures, or to other parts of these diverse nations, cannot be sustained by this evidence alone. Second, the findings are based on self-reports and are cross-sectional in nature. Self-report methods are, of course, warranted in the exploration of values

and perceived needs, and in the assessment of subjective well-being, but accompanying observations of behaviors, practices, and adjustment outcomes would provide a fuller explication of these constructs and their operation. Longitudinal data would help, additionally, in clarifying causal pathways. Finally, because only two cultures are compared, generalization to other cultural groups is not justified. Thus, this study represents only a beginning to a research program that could address the expression of autonomy-support versus control in other cultures, and its functional effects.

In sum, the findings of this study suggest that for both Russian and U.S. adolescents, the issue of autonomy-support versus control by parents and teachers has salience and significance. It appears that in both cultural samples, perceiving others as supporting one's autonomy facilitates well-being and self-motivation. In this sense, the concept of autonomy is perhaps a psychological variable worth studying in diverse nations and cultures and may be less culturally delimited an idea than many authors have assumed. Although there may be cultural variations in how and to what extent autonomy is supported and expressed, the need to experience one's behavior as self-regulated and self-endorsed may be critical to psychological health across human groups, as Self-Determination Theory has suggested.

NOTES

1. To assess model fit we used well-established indices: the goodness-of-fit index (GFI), the Root Mean Square Error of Approximation (RMSEA), the Incremental Fit Index (IFI), and Comparative Fit Index (CFI), (Hoyle & Panter, 1995; Hu & Bentler, 1995; Joreskog & Soborn, 1993; Ullman, 1996). Because of its oversensitivity to the trivial discrepancies between covariance matrices, the likelihood ratio chi-square statistic was not used in the decision making about the model accessibility but is nonetheless presented. It should be nonsignificant in a well-fitting model. For the indices GFI, IFI, and CFI, values of about .90 or higher are generally considered acceptable, and for the invariance test we used a difference-in-fit criterion of < .05 (Little, 1997). For RMSEA, we used the conventional decision rule: < .05 represents a small error of approximation and a very good fit of the model; .08 suggests a reasonable error of approximation; and RMSEA > .10 indicates poor fit.

2. To interpret this data correctly, one has to take into account the nature of MACS analysis. According to Little (1997, 2000), the test of construct comparability with MACS methodology has to be done on two levels: Measurement equivalence has to be established on an indicator-to-construct level, and the cross-group comparison of the reliable construct parameters (means, variances and correlations) has to be tested on a latent level. On the measurement level, the culture-related influence on the common-variance components of observed indicators is estimated. But, equivalence on the measurement level does not mean the equality of the three construct parameters (means, variances, correlations) on the latent level. These differences on the latent-construct level represent a direct cultural influence on truly and reliably estimated psychological constructs. Therefore, the measurement equivalence of constructs can be accompanied by differences between groups in means, variances, and/or correlations. This will mean that there is no differential influence of culture-related factors on specific components of measured indicators variance, but there are differences between cultures on means and variances of measured psychological constructs, and/or correlations between them.

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