Need Satisfaction, Motivation, and Well-Being in the Work Organizations of a Former Eastern Bloc Country: A Cross-Cultural Study of Self-Determination

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Past studies in U.S. work organizations have supported a model derived from self-determination theory in which autonomy-supportive work climates predict satisfaction of the intrinsic needs for competence, autonomy, and relatedness, which in turn predict task motivation and psychological adjustment on the job. To test this model cross-culturally, the authors studied employees of state-owned companies in Bulgaria, a country that has traditionally had a central-planning economy, a totalitarian political system, and collectivist values. A sample from a privately owned American corporation was used for comparison purposes. Results using structural equation modeling suggested that the model fit the data from each country, that the constructs were equivalent across countries, and that some paths of the structural model fit equivalently for the two countries but that county moderated the other paths.

The vast majority of studies of motivational processes in work organizations have been conducted in the United States, and most of the others were done in countries that also have democratic governments, privately owned companies, and a relatively strong emphasis on individualism. This raises the question of whether the dynamics that have been highlighted by motivational theories and research are in fact applicable to other cultures with economic systems, governments, and cultural values that are different from those in the United States.

Self-determination theory (Deci & Ryan, 1985b; Ryan & Deci, 2000), which posits universal psychological needs, suggests that humans will be motivated and display well-being in organizations to the extent that they experience psychological need satisfaction within those organizations, yet the relevance of the theory to the workplace has not been tested cross-culturally. The present study was designed as a first step to test the generalizability of the theory to the work organizations of varied cultures. We selected Bulgaria because the dominant experiences of the citizens of this former Eastern Bloc country have involved a totalitarian rather than democratic political system, state-owned companies operated by central-planning principles rather than privately owned companies operated by market-economy

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principles, and collectivistic rather than individualistic cultural values.

Several studies based on self-determination theory have examined the utility of psychological need satisfaction for predicting motivation and adjustment in the workplace. The theory posits three universal psychological needs—the needs for competence, autonomy, and relatedness—and suggests that work climates that allow satisfaction of these needs facilitate both work engagement and psychological well-being. Thus, contextual variables that support need satisfaction, as well as self-reports of need satisfaction on the job, should both predict people's work involvement and mental health.

Competence requires succeeding at optimally challenging tasks and attaining desired outcomes (e.g., Skinner, 1995; White, 1959); autonomy requires experiencing choice and feeling like the initiator of one's own actions (deCharms, 1968; Deci, 1975); and relatedness requires a sense of mutual respect, caring, and reliance with others (Baumeister & Leary, 1995; Harlow, 1958). Self-determination theory defines these needs as nutriments that are essential for people's survival, growth, and integrity (Ryan, Sheldon, Kasser, & Deci, 1996). This view, which assumes that needs are innate rather than learned, suggests that a desire or goal (e.g., wanting more money or wanting a primary relationship) represents a true need only if its level of satisfaction relates directly to people's level of well-being. Several studies have provided evidence that is consistent with the postulate that competence, autonomy, and relatedness are in fact true needs.

For example, in a study of voluntary work participation in supervised work settings, Kasser, Davey, and Ryan (1992) found that psychiatric patients' reports of the degree to which they were able to satisfy these three needs on the job predicted the amount of time they spent at work. In a study by Ilardi, Leone, Kasser, and Ryan (1993), factory workers who experienced greater satisfaction of the needs for competence, autonomy, and relatedness in the workplace reported more positive job attitudes, higher self-esteem, and fewer symptoms of ill-being than their colleagues who experienced less need satisfaction. Together, these studies indicate that need fulfillment is important for motivation and well-being at work.

Subsequent research by Baard, Deci, and Ryan (2000) explored the relation between need satisfaction on the job and both work performance and psychological adjustment. Two studies supported the self-determination model, in that workers' perceptions of their supervisors' autonomy support and the workers' individual differences in autonomous orientation independently predicted the degree to which the workers were able to satisfy their needs for competence, autonomy, and relatedness on the job, which in turn predicted the workers' performance ratings as well as their well-being, indexed by vitality and the reverse of anxiety and somatization.

Autonomy support requires supervisor's understanding and acknowledging their subordinates' perspectives, providing meaningful information in an informational manner, offering opportunities for choice, and encouraging self-initiation (e.g., Deci & Ryan, 1985b). Several previous studies had shown positive relations between autonomy support and work outcomes, although those studies did not consider the mediating role of need satisfaction. For example, a field study by Deci, Connell, and Ryan (1989) found that when corporate managers were more autonomy supportive, their workgroup members reported a higher level of trust in the corporation and more overall job satisfaction. Pajak and Glickman (1989), using a simulation paradigm, similarly showed that autonomy-supportive supervision inspired more trust and loyalty. Blais and Brière (1992) found that when managers were perceived by their subordinates as more autonomy supportive, the subordinates displayed greater job satisfaction, less absenteeism, and better physical and psychological well-being. Finally, studies have documented that autonomy-supportive conditions catalyze people's intrinsic motivation (Gagné, Senecal, & Koestner, 1997; Tetrick, 1989) and expressions of conscientiousness (Barrick & Mount, 1993) on the job.

According to self-determination theory, the concept of autonomy support specifies the nutriments necessary for autonomous motivation. Because the theory also postulates that supports for competence and relatedness are necessary for either autonomous motivation or controlled motivation, supports for competence and relatedness are necessarily implicit in the concept of autonomy support. Consequently, autonomy support also would be expected to facilitate experienced satisfaction of the needs for competence and relatedness, as was found in the Baard et al. (2000) study.

The autonomous orientation is an individual difference variable assessed with the General Causality Orientations Scale (Deci & Ryan, 1985a). It concerns the degree to which, in general, individuals tend to orient toward environmental factors that support their self-initiation and choice. In other words, it reflects a tendency to orient toward autonomy-supportive aspects of the social environment rather than to organize behavior on the basis of external controls. Although various studies have related the autonomous orientation to goals theorized to facilitate need satisfaction and well-being (e.g., Kasser & Ryan, 1993; Sheldon & Kasser, 1995), the Baard et al. study was the first to use it in a work organization to examine its relation to need satisfaction and work outcomes.

In sum, the Baard et al. study, in line with previous studies, showed that workers' reports of both perceived autonomy support from their supervisors and their own orientation toward experiencing environments as autonomy supportive were positively associated with the workers' level of need satisfaction and in turn with positive work outcomes.

The Self-Determination Model

Implicit in the self-determination model is the assertion that the three psychological needs are universal—that they are basic to all people—therefore, satisfaction of these needs should yield positive outcomes in all cultures. As such, we hypothesize that, within any culture, the degree to which employees experience need satisfaction in their work organizations will predict important aspects of organizational effectiveness and employee well-being. Specifically, we predict that the contextual factor of managerial autonomy support will lead to overall need satisfaction and, in turn, to greater task engagement and psychological well-being. Although we believe there are contextual factors that might promote satisfaction of one need and not the others, the predictor variable in this model is *managerial autonomy support*, which is expected to promote satisfaction of all three needs. Furthermore, because the theory postulates that satisfaction of all three innate needs is necessary for well-being, overall need satisfaction is hypothesized to relate positively to motivation and well-being. Accordingly, overall need satisfaction is specified as the important mediator between managerial autonomy support and the outcomes of task engagement and well-being. The model, which will be tested with structural equation modeling, uses satisfaction of each need as an indicator of the latent variable *overall need satisfaction*. In the model presented in Figure 1, general self-esteem and the reverse of anxiety are used to index well-being.

The present study was designed to test this model cross-culturally. We selected Bulgaria because, although it is industrialized, it is far less advanced technologically and has operated under a dramatically different economic system from the United States, where the previous studies had been conducted. Specifically, we collected data in 10 Bulgarian work organizations after Bulgaria had made its initial accommodation to having been freed from Soviet domination. In addition, a smaller sample of American workers was used to allow examination of cross-cultural equivalence of our constructs.

Work Organizations in Bulgaria[1]

Prior to 1989, when Bulgaria was still under Soviet domination, all work organizations were state owned and operated by central planning principles. Pricing of goods and services was relatively independent of the cost

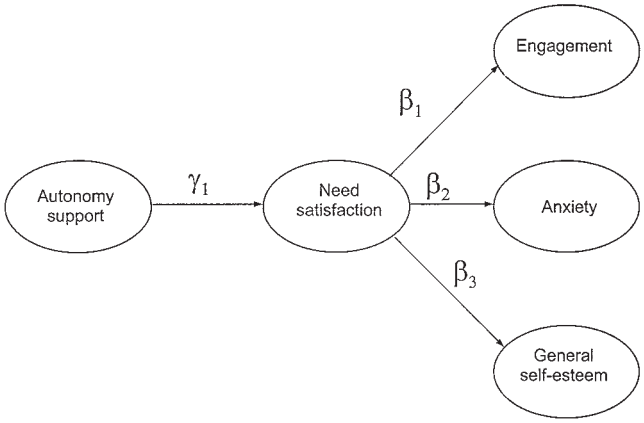

Figure 1 **Self-determination model showing hypothesized relations among the autonomy-supportiveness of the work climate, intrinsic need satisfaction, task engagement, and two indicators of well-being.**

of producing the goods or providing the services and was instead based primarily on political considerations. Companies were not required to meet their own expenses and, because the companies were simply an arm of the state, all shortfalls were justified by the fact that the companies were not only providing goods and services to the nation's people but also were providing the people with jobs. Although wages were very low, citizens felt secure in knowing that they could count on having a job regardless of whether their job occupancy was contributing meaningfully to the company or to the country.

In November 1989, when Todor Zhivcov, a Stalin protégé, stepped down after more than 30 years as Bulgaria's totalitarian president, there was a period of many months in which the country had a serious shortage of food and energy and citizens experienced a very high level of anxiety. Social Democrats were voted into power and all relevant parties declared support for market-oriented reforms. Nonetheless, change was very slow to come, for it not only required a set of procedures that the government had not developed (such as what criteria and methods to use in selling state-owned companies) but it also required a dramatically different mindset. Companies and individuals had never been required to balance the bottom line and feared its consequences. Companies had no experience operating in a way that would generate revenues greater than or equal to expenses, and most individuals did not endorse the idea of having to contribute an amount and quality of work that justified their pay. In short, companies and many of the individuals who worked in them resisted meaningful change because they experienced it as seriously threatening.

Because of the anxiety and resistance during the early 1990s, just 5 years after Zhivcov left office, the communists were voted back into power. No significant state-owned company had passed into private hands, and although individuals were opening their own small businesses (e.g., cafes and taxi services), more than 90% of Bulgarian workers were still employed in state-owned companies.

By the mid-1990s, state-owned companies operated with what might be called a modified central planning method. They were strongly encouraged to balance the bottom line by making sufficient revenues to pay expenses, but it also was recognized that many of the companies served the needs of the nation (e.g., the National Telecommunications Company provided telephone service to the country); therefore, the government was willing to allow deficits as a function of the degree to which the goods or services provided by companies were important for the country's functioning. It was a time of great economic difficulty for Bulgaria, and it was not unusual for the state to be 4 or 5 months behind in paying the wages of employees in the less-essential, state-owned companies.

By that time, trade unions had become relatively strong in some industries, with the sole objective of protecting workers in the relevant companies. Workers in the larger, more-essential companies had salaries that, although extremely low by Western standards, were good by Bulgarian standards; therefore, they did not want to risk losing what they had. Thus, the unions tended to oppose privatization and economic reform.

Informal observations of work groups in Bulgaria suggested complex and interesting possibilities in terms of need satisfaction. In many traditional work groups, relatedness and harmony appeared to be highly valued, whereas competence was not a central concern. Often, supervisors and work-group leaders in state-owned companies were "elected" by their subordinates within the structure of the local communist party, conveying the suggestion of some empowerment at the level of immediate supervision. However, major decisions were very much "top-down," seeming to emanate from high levels of government bureaucracy.

This was the climate of the country when we began this research in 10 state-owned Bulgarian companies. The companies were operating by what we called the modified central-planning principles, and most individuals knew very little about and were fearful of life in a market economy, although preliminary steps toward privatization had been taken. Collectivist values and the idea of common good were still very strong, and although there were national elections, the Communist Party was a strong force.

METHOD

Participants

We invited 548 Bulgarian adults to participate in the research. They came from 10 Bulgarian companies, including the National Telecommunications Company, a large banking company, the major national gas and oil company, a mechanical construction firm, and 6 other much smaller companies. Of the 548 possible participants, 431 provided complete data; therefore, that group represented the Bulgarian sample used in all analyses. Approximately two thirds were women.

To obtain an American sample for comparative purposes, the clerical employees of a small American data-management firm were invited to participate in the research by completing the same questionnaires that had been given to the Bulgarians. Of those, 139 agreed to participate and 128 provided complete data and thus represented the American sample. Approximately three quarters were women.

Translation of Instruments

Parts or all of five measures were used in this research: the Work Climate Survey to assess managers' autonomy support (Deci et al., 1989), the Need Satisfaction Scale to assess workers' experience of satisfaction of the three basic psychological needs (Ilardi et al., 1993), the Work Engagement Scale to assess the degree to which the workers are actively involved in their jobs (Baard et al., 2000), the Anxiety subscale from the General Health Survey to assess workers' recent feelings of anxiety (Goldberg & Hillier, 1979), and the General Self-Esteem subscale from the Multidimensional Self-Esteem Inventory (O'Brien & Epstein, 1989).

Each measure was translated into Bulgarian by a professional English-Bulgarian translator. Two English back-translations of the translated questionnaires were done by two additional professional translators. The two back-translations were compared by the first two authors of this article, and differences between the two back-translations and between the back-translations and the original were noted. Then, the first two authors met with two highly fluent English-speaking Bulgarians who had substantial backgrounds in psychology (the fifth and sixth authors), and this group of four individuals discussed every item on the questionnaires in an attempt to ensure that the Bulgarian versions conveyed the psychological meaning that was intended. In any cases where there was a discrepancy between the original and the back-translations, and in any cases where the two Bulgarian researchers thought there was ambiguity in the Bulgarian version, a discussion ensued to clarify exactly what was intended in the English version and what was the best way to capture that in Bulgarian. The items from the

original translation, as modified in the subsequent discussions, were used for the data collection.

Procedure

All Bulgarian participants were contacted through companies. More than 95% were contacted through the companies where they worked, and the remainder were contacted through an employment agency where they had registered to apply for jobs. After top managers had granted permission for their employees to participate in the project, the employees attended a group meeting where the research was explained and they were given the questionnaires. Those from the employment agency completed the questionnaires in individual sessions. All participants were told that participation was voluntary and that their managers would never see their questionnaires; therefore, if they chose not to participate they could simply not complete the questionnaires. Because the employees were at a group meeting, they had to remain in the room for the full meeting to maintain their anonymity; therefore, their way of not participating was simply to not complete all the questionnaires. Thus, the 21% who did not provide complete data were essentially those people who chose not to participate in the study.

The American participants all worked for one company and were contacted by the researchers after the owner had granted permission for the study. They completed the questionnaires individually, at their own scheduling, during a 10-day period. Unlike those in the Bulgarian companies, they could chose whether to take a packet of the questionnaires; therefore, the percentage not providing complete data was considerably lower (8%).

Measures

Work Climate Survey (WCS). Developed by Deci et al. (1989), this instrument was patterned after the Job Diagnostic Survey (Hackman & Oldham, 1975). There are four sections to the measure, but only items from the first two sections were used for this research. Those sections contain 28 items, rated on Likert-type scales. Ten items, consisting of three subscales, concern the degree to which the work context is autonomy supportive: autonomy support by immediate supervisor (3 items), autonomy support by top management (3 items), and a supportive work climate (4 items). These three subscale scores were used as indicators for the latent variable *autonomy support.* Cronbach's alphas for the three subscales were as follows: for the Bulgarian data: supervisor support = .69, top management support = .79, and supportive climate = .80; for the American data: supervisor support = .75, top management support = .81, and supportive climate = .75.

Intrinsic need satisfaction. A 21-item questionnaire assesses the extent to which employees experience satisfaction of their three intrinsic needs—autonomy, competence, and relatedness—on their job. There were 6 items for competence, 8 items for relatedness, and 7 items for self-determination, to which participants responded on 5-point, Likert-type scales. Sample items are as follows: for competence, "I enjoy the challenge my work provides"; for relatedness, "I really like the people I work with"; and for self-determination, "I feel like I can make a lot of inputs to deciding how my job gets done." The three subscale scores were used as indicators of the latent variable *intrinsic need satisfaction.*

The Cronbach's alpha for the total need-satisfaction scale in the Bulgarian sample was .83 and in the American sample was .89. For the competence, relatedness, and autonomy subscales, the alphas in the Bulgarian data were .81, .57, and .62, respectively, and in the American data were .73, .84, and .79, respectively. Baard et al. (2000) found intrinsic need satisfaction to be positively correlated with work performance ratings and with psychological adjustment, thus supporting the validity of the construct.

Work engagement. A nine-item self-report measure was created for this study using Connell's (1990) concept of school engagement. It includes items tapping both behavioral and emotional aspects of engagement on the job; participants respond on 7-point Likert scales. Sample items are as follows: for behavior, "When I'm on the job, I work as hard as I can," and for emotion, the reverse of "When I'm at work, I often feel bored." Cronbach's alpha in the Bulgarian sample was .69, and in the American sample was .79. Because there were nine items in this scale, we randomly created three groups of three items each (Kishton & Widaman, 1994) and used the average of each group as an indicator of the latent variable *work engagement.*

Anxiety. The General Health Questionnaire (GHQ) is a 28-item questionnaire (Goldberg & Hillier, 1979) that assesses the extent to which participants experience the presence of four types of psychiatric or adjustment symptoms: depression, anxiety, somatic symptoms, and social dysfunction. Respondents report on 4-point Likert-type scales how frequently they have experienced these difficulties over the past few weeks. In the present study, only the 7 items related to anxiety were used. Numerous studies have shown the scale to be both reliable and valid (e.g., Goldberg, Cooper, Eastwood, Kedward, & Shepherd, 1970). In the present study, the alpha was .85 for the Bulgarian data and .61 for the American data. Because the alpha was low for the American sample, our analyses in both countries used only the 4 items with the highest lambda values as indicators for the latent

variable *anxiety* when we tested the structural model with EQS (Bentler & Wu, 1998).

General self-esteem. This variable was measured with the 10 items from the general subscale of the Multidimensional Self-Esteem Inventory (O'Brien & Epstein, 1989). It is a widely used scale and has well-established reliability and validity. In this study, the alpha was .78 for the Bulgarian data and .66 for the American data. For testing the structural model, we randomly created five pairs of items and used the average of each pair as an indicator for the latent variable (Kishton & Widaman, 1994).

Overview of the Analyses Testing the Model and Its Cross-Cultural Equivalence

The hypothesized model was tested using EQS 5.7a (Bentler & Wu, 1998), with maximum likelihood estimation. Because there was substantial multivariate kurtosis in each sample (the normalized Mardia coefficients were 11.44 in Bulgaria and 2.41 in the United States), we used Satorra and Bentler's (1988) correction when estimating all parameters.

To test the fit of the hypothesized model within each country, we followed the two-step approach recommended by Anderson and Gerbing (1988). First, to determine whether the indicators were related satisfactorily to the latent variables, a confirmatory factor analysis was performed for the measurement model in each sample. In the confirmatory factor analysis, the factor loading of one indicator for each latent variable was fixed to 1.0 to establish the metric of the latent variable (a procedure we followed in all EQS analyses to render the metric equivalent across samples) (Marsh, 1994). Correlations were allowed between the pairs of latent variables specified in the structural model shown in Figure 1, and correlations between other variables were set to 0.0. Second, we tested the fit of the structural model within each country. Path coefficients were determined for each of the hypothesized paths, whereas the relations between all other pairs of variables were set to 0.0. Because the confirmatory factor analysis (CFA) and the test of the structural model within each country contained the same number of constraints, the degrees of freedom were the same in each of these analyses for each country.

To examine the fits of the measurement and structural models, we used the chi-square statistic and three relative fit indices that are relatively free of the influence of sample size effects (Bollen, 1989), namely, the nonnormed fit index (NNFI) (Tucker & Lewis, 1973), the comparative fit index (CFI) (Bentler, 1990), and the root mean square error of approximation (RMSEA) (Steiger, 1990). A good fit would be indicated by a nonsignificant chi-square test statistic, values greater than or equal to .90 for the NNFI and CFI, and a value less than or equal to .10 for the RMSEA.

Subsequently, we performed invariance analyses to determine comparability both of the latent constructs and of the structural model across countries. For these invariance analyses, we followed guidelines presented by Bollen (1989) and Little (1997). Bollen suggested testing equivalence across samples by performing a set of hierarchically organized comparisons based on the sequential imposition of constraints to the models.

First, for the measurement model, the measurement coefficients (lambdas) were constrained and the fit of the model with all lambdas constrained was compared to fit of the model when measurement coefficients were unconstrained. For this step in testing equivalence, Little (1997) suggested examining differences in the fit indices, such as the CFI, NNFI, and RMSEA, for the constrained versus the unconstrained models rather than using change in chi-square because change in chi-square is overly sensitive when there are a large number of constraints (see also Marsh, Balla, & McDonald, 1988). If the fit of the measurement model is good (NNFI > .90, CFI > .90, and RMSEA < .10) when no constraints are imposed, a difference of less than .05 between the values of the fit indices for the constrained versus unconstrained models indicates equivalence of the measurement models across the samples.

Second, to test the equivalence of the strength of the relations among variables in the structural model in the two countries, the path coefficients (gammas and betas) were systematically constrained and those models were compared to the model in which only the measurement coefficients were constrained. For these invariance analyses, we used the difference in chi-square to compare models, as suggested by Little (1997). In testing the equivalence of the path coefficients across samples, we first did four separate analyses in which one of the four hypothesized paths was constrained in each analysis. This allowed us to determine how much unique influence the constraint of each path had on the chi-square value for the model. Then, using that information, we proceeded in a stepwise fashion, first constraining the path that, when uniquely constrained, had led to the least change in the fit of the model, then constraining the path that led to the second smallest change in the fit indices, and so on until all four paths had been constrained. At each step, we compared the fit of that model to the fit of the model in which only the measurement coefficients were constrained to ascertain the maximum number of equivalent paths in the structural model (specifically, until there was a significant change in the chi-square). Thus, for example, to compare the model with all of the measurement coefficients constrained to the model that has two paths of the structural model con-

TABLE 1: Means and Standard Deviations of Observed Constructs in the Bulgarian (n = 431) and U.S. (n = 128) Samples

	Bulgaria		*United States*		
Variable	M	SD	M	SD	t *Test* (df = *557*)
Supervisor autonomy support	4.84	1.88	4.15	1.65	4.01***
Top management autonomy support	3.29	1.79	3.96	1.49	–4.27***
Environment support	3.40	1.28	3.09	0.63	3.73***
Need for autonomy	3.58	0.65	3.15	0.85	5.31***
Need for relatedness	3.94	0.74	3.89	0.69	0.70
Need for competence	3.86	0.65	3.74	0.75	0.07
Total need satisfaction[a]	3.79	0.54	3.59	0.65	3.17**
Engagement	4.84	0.60	5.60	0.89	–9.05***
Anxiety	2.54	1.00	1.71	0.35	14.56***
General self-esteem	3.10	0.68	3.43	0.76	–4.45***

a. Total need satisfaction was calculated as the average of the three need indicators.
**p < .01. ***p < .001.

strained, the difference between the chi-square values for the two models was calculated (using degrees of freedom equal to the difference in the degrees of freedom of the two models). A nonsignificant value for the difference indicates equivalence between the two samples for the two paths that were constrained.

RESULTS

Preliminary Analyses

The means and standard deviations for the study variables are presented in Table 1, along with the t tests comparing the means for the two countries.

One can see from Table 1 that Americans perceived more autonomy support from top management, whereas Bulgarians perceived greater autonomy support from their supervisors and the work environment. Furthermore, Bulgarians perceived greater satisfaction of their need for autonomy, but participants from the two countries did not differ on their experienced satisfaction of the other two needs. A composite variable for need satisfaction was created by averaging the three needs to have an overall need-satisfaction variable for the correlational analyses that was comparable to the need-satisfaction latent variable used in the EQS analyses. It revealed that Bulgarian workers experienced significantly greater need satisfaction than did American workers.[2] Finally, Americans were more engaged in their work and reported higher self-esteem, whereas Bulgarians reported more anxiety.

The intercorrelations among the variables appear in Table 2, shown separately for Bulgaria and the United States.[3] As shown in Table 2, of the 32 correlations between an autonomy support variable and a need satisfaction variable across the two countries, all but one (autonomy support from top management with the relatedness need in Bulgaria) were highly significant. Of the 24 correlations between an autonomy support variable and an outcome variable across the two countries, all but 5 were significant. In general, as is typical in a hypothesized mediational relation, the context variables tended to be more strongly related to the need satisfaction (i.e., mediating) variables than to the outcome variables. Need satisfaction variables also were strongly related to the outcome variables (22 of the 24 correlations were significant). The pattern of relations was thus consistent with the theoretical model presented in Figure 1.

Analyses Examining Fit of the Model

First, the confirmatory factor analyses were done for each sample. Results indicated that although the chi-square statistics were significant in each sample, the other fit indices suggest that the fit of the measurement model was reasonable although not good. Specifically, in Bulgaria, the chi-square (df = 131) was 402.38 (p < .001), the NNFI was .87, the CFI was .89, and the RMSEA was .07; and in the United States, the chi-square (df = 131) was 259.34 (p < .001), the NNFI was .87, the CFI was .89, and the RMSEA was .09.

Next, we tested the full structural model in each sample, and these analyses are presented in the top portion of Table 3. As can be seen in the table, the chi-square statistics were significant in each country but the other fit indices indicated good fit of the structural model in each country. For Bulgaria, the NNFI was .91, the CFI was .92, and the RMSEA was .06; and for the United States, the NNFI was .88, the CFI was .90, and the RMSEA was .09. Also shown in Table 3, all paths were significant at p < .01 in both samples. Overall, analyses indicate that the model fit the data satisfactorily in both countries: autonomy support enhanced need satisfaction, which in turn reduced anxiety and enhanced task engagement and general self-esteem.

TABLE 2: Correlation Matrix of Observed Constructs for the Bulgarian Sample ($n = 431$) Below the Diagonal and for the U.S. Sample ($n = 128$) Above the Diagonal

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1. Supervisor autonomy support		.44***	.49***	.79***	.77***	.32***	.57***	.67***	.13	–.19*	.20*
2. Top management autonomy support	.55***		.55***	.82***	.47***	.14	.34***	.40***	.29**	–.24**	.14
3. Environment support	.74***	.56***		.84***	.65***	.29**	.48***	.57***	.27**	–.40***	.09
4. Total autonomy support[a]	.81***	.74***	.81***		.78***	.31***	.57***	.67***	.32***	–.28**	.17*
5. Need for autonomy	.33***	.24***	.32***	.52***		.49***	.71***	.88***	.21*	–.35***	.23*
6. Need for relatedness	.21***	.17***	.39***	.46***	.45***		.52***	.77***	.15	–.28**	.14
7. Need for competence	.27***	.25***	.29***	.46***	.50***	.38***		.88***	.42***	–.35***	.37***
8. Total need satisfaction	.48***	.34***	.61***	.61***	.81***	.79***	.78***		.39***	–.36***	.28**
9. Engagement	.20***	.30***	.24***	.43***	.33***	.16**	.46***	.46***		–.19*	.25**
10. Anxiety	–.11*	–.23***	–.29***	–.27***	–.31***	–.23***	–.32***	–.36***	–.27***		–.36***
11. General self-esteem	.04	.03	.10*	.15**	.28***	.30***	.34***	.39***	.11*	–.38***	

NOTE: The complete correlation matrix can be obtained from the first author.
a. Total autonomy support was calculated as the average of the three autonomy support variables after they were standardized within country.
*$p < .05$. **$p < .01$. ***$p < .001$.

TABLE 3: Results of the EQS Structural Analyses in Each Country and Invariance Analyses Across Countries

Model Tested	γ_1	β_1	β_2	β_3	χ^{2a}	*NNFI*	*CFI*[a]	*RMSEA*	χ^2_{diff}[a, b]
SEM, Bulgaria (131)	0.14***	0.70***	–1.16***	0.75***	322.69***	.91	.92	.06	
SEM, United States (131)	0.60***	0.31***	–0.22**	0.27**	243.34***	.88	.90	.09	
IA with no constraints (262)					599.67***	.90	.91	.05	
IA, all λ's constrained (275)					662.06***	.89	.90	.05	62.39***
IA, β_1 constrained (276)		0.61***			663.17***	.89	.90	.05	1.11
IA, β_1 and β_3 constrained (277)		0.62***		0.59***	666.77***	.89	.90	.05	4.71
IA, β_1, β_2 and β_3 constrained (278)		0.62***	–0.60***	0.58***	691.31***	.88	.89	.05	29.25***
IA, all paths constrained (279)	0.17***	0.66***	–0.66***	0.63***	723.16***	.87	.89	.05	61.10***

NOTE: Degrees of freedom are in parentheses. SEM = structural equation model, IA = invariance analysis, NNFI = non-normed fit index, CFI = comparative fit index, and RMSEA = root mean square error of approximation. Parameter estimates are unstandardized and are calculated with the Satorra-Bentler correction.
a. The χ^2, CFI, and CFI_{diff} are corrected using the Satorra-Bentler formula for all models except for the invariance analyses.
b. The unconstrained model served as the baseline model for the invariance analysis evaluating measurement equivalence (second invariance analysis), whereas the model with all λ's constrained was the baseline model for the invariance analyses evaluating structural equivalence.
**$p < .01$. ***$p < .001$.

Because there were multiple companies in the Bulgaria data set, with employees nested within companies, we did a set of supplemental analyses to ensure that company did not distort the relations among the important constructs. We performed multilevel modeling using the hierarchical linear modeling program (Bryk & Raudenbush, 1992) to control for this nonindependence. In these analyses, we used the autonomy support composite and the need satisfaction composite, as well as total scores for engagement, anxiety, and general self-esteem; 418 employees were included in the analyses. In all four analyses, *company* was the Level 2 variable: In the first analysis, *autonomy support* was the Level 1 variable and *need satisfaction* was the dependent variable; in the second analysis, *need satisfaction* was the Level 1 variable and *engagement* was the dependent variable; in the third analysis, *need satisfaction* was the Level 1 variable and *anxiety* was the dependent variable; and in the fourth analysis, *need satisfaction* was the Level 1 variable and *self-esteem* was the dependent variable. After removing the variance accounted for by company membership, all four paths were significant. For the path from autonomy support to need satisfaction, the $gamma_1 = .40$, $p < .001$; for the path from need satisfaction to engagement, the $gamma_1 = .55$, $p < .001$; for the path from need satisfaction to anxiety, the $gamma_1 = –.56$, $p < .001$; and for the path from need satisfaction to self-esteem, the $gamma_1 = .49$, $p < .001$. Thus, the paths of the structural model were all significant even after controlling for company.

Analyses Examining Gross-Cultural Equivalence

Having established that the measurement and structural models fit the data in both samples, we proceeded

with the equivalence analyses across the two samples. We first examined the equivalence of the measurement model by constraining all measurement coefficients (lambdas) and comparing the fit of this model to the fit of a baseline model in which none of the measurement coefficients were constrained. These analyses can be found in the first two lines of the bottom portion of Table 3. The measurement models for the two countries fit the data in an equivalent fashion, as indicated by the following changes in relative fit indices ($NNFI_{change} = .01$, $CFI_{change} = .01$, $RMSEA_{change} = .00$).

We then proceeded to separately test the equivalence of each path coefficient by performing four tests in which we constrained the measurement coefficients and additionally constrained just one of the four path coefficients in each test, comparing the fit of the model in which one of the path coefficients was constrained to the fit of the model in which only the measurement coefficients were constrained. Using the magnitude of the resulting change in chi-square values, we determined which constrained path had the smallest influence on the chi-square, which had the second smallest, and so on. The path from need satisfaction to engagement had the least influence, the path from need satisfaction to self-esteem has the second smallest influence, the path from need satisfaction to anxiety was third, and the path from autonomy support to need satisfaction had the most influence on the fit indices. Then, in stepwise fashion, we constrained the four path coefficients in this sequence, comparing the fit of the constrained model at each step to the fit of the model in which only the measurement coefficients were constrained. Table 3 presents the results of this stepwise approach.

Constraining the path between need satisfaction and task engagement yielded a nonsignificant change in fit: chi-square $(1)_{change} = 1.11$, *ns*. In addition, constraining the path between need satisfaction and self-esteem also yielded a nonsignificant change in fit: chi-square $(2)_{change} = 4.71$, *ns*, and constraining the path between need satisfaction and anxiety did yield a significant change in fit: chi-square $(3)_{change} = 29.25$, $p < .001$. Finally, we added a constraint to the last path between autonomy support and need satisfaction, which also yielded a significant change in fit (both relative to the baseline model with measurement constraints and relative to the model preceding it with three paths constrained). Compared to the baseline model, chi-square $(4)_{change} = 61.10$, $p < .001$. These results suggest that the strength of the relations between need satisfaction and task engagement and between need satisfaction and general self-esteem were equivalent across cultures but that the strength of the relations between autonomy support and need satisfaction and between need satisfaction and anxiety were not equivalent across cultures. This nonequivalence suggests that in the two cultures represented in this study, the strength of the relations between these variables is moderated by sociocultural factors.

Figure 2 presents the model judged to best fit the data, which is the one with constraints on the paths from need satisfaction to task engagement and need satisfaction to general self-esteem. For these paths, only the one path coefficient for the two countries is reported in the figure. Inspection of the results depicted in Figure 2 shows a considerably stronger relation between autonomy support and need satisfaction in the American sample (.67) than in the Bulgarian sample (.15), and a considerably stronger relation between need satisfaction and anxiety in the Bulgarian sample (–1.07) than in the American sample (–.30).

With this model, the unstandardized indirect effects of autonomy support were .09 on task engagement, –.16 on anxiety, and .09 on self-esteem in the Bulgarian sample, whereas the indirect effects of autonomy support were .42 on task engagement, –.20 on anxiety, and .40 on self-esteem in the American sample. Furthermore, in the Bulgarian sample, 23% of the variance in need satisfaction was accounted for by autonomy support, 29% of the variance in task engagement was accounted for by the model, 24% of the variance in anxiety was accounted for by the model, and 21% of the variance in self-esteem was accounted for by the model, whereas in the United States' sample, 76% of the variance in need satisfaction was accounted for by autonomy support, 20% of the variance in task engagement was accounted for by the model, 11% of the variance in anxiety was accounted for by the model, and 21% of the variance in self-esteem was accounted for by the model.

To summarize, there was reasonable support in both cultures for the model hypothesized in Figure 1, with every path found to be significant. This model suggests that, in both cultures, satisfaction of the basic psychological needs plays a mediating role between the context variable of autonomy support and motivation and well-being, even though the strengths of two of these relations were found to differ in magnitude across the two cultures.

DISCUSSION

There has been considerable controversy about the generalizability of human needs across cultures; that is, about whether there are universal psychological needs (e.g., Heine, Lehman, Markus, & Kitayama, 1999). Self-determination theory posits that there are innate psychological needs for competence, autonomy, and relatedness, which implies that satisfaction of these three needs would promote motivation and well-being in all cultures. Accordingly, the present study was intended, in part, to examine whether the data from these dramati-

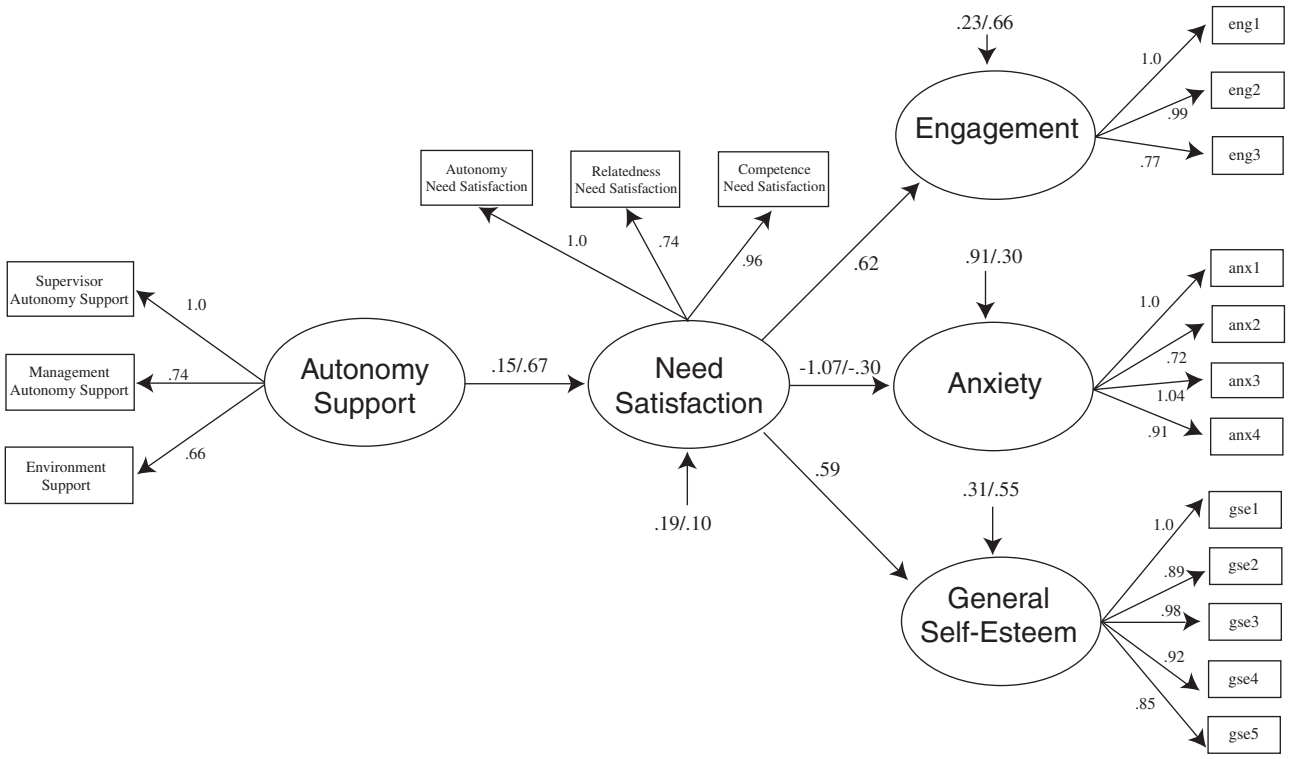

Figure 2 Standardized parameter estimates from the cross-cultural analyses for the full structural model (using EQS), with constrained measurement coefficients and constrained path coefficients for the paths judged to be equivalent.

NOTE: For paths in the structural model that were judged equivalent across countries, only one coefficient is reported, representing both countries. For paths that were judged nonequivalent, a coefficient is reported for each country, with the Bulgarian coefficient before the slash and the U.S. coefficient after the slash. Measurement error terms (thetas and epsilons) are not shown. All path and measurement coefficients are significant at $p < .001$; $\chi^2(275) = 662.06$, $p < .001$, non-normed fit index = .89, comparative fit index = .90, root mean square error of approximation = .05; eng = engagement, anx = anxiety, and gse = general self-esteem.

cally different cultures would reveal relations between need satisfaction and both motivational and well-being outcomes.

Specifically, the study tested a self-determination model of task engagement and psychological adjustment in the workplace, with perceived autonomy support being theorized to facilitate satisfaction of the intrinsic needs for competence, autonomy, and relatedness, and with those in turn being hypothesized to promote work engagement and well-being (here indexed as higher self-esteem and lower anxiety). The model, which had received support from previous studies in the United States, was examined with data from employees of state-owned companies in Bulgaria and a comparison sample from a U.S. corporation.

Analyses revealed that the measurement model fit the data in both countries and that the fit was equivalent across the two cultures. This indicates that the constructs are meaningful in each culture and that the translation of questionnaires was successful in preserving the psychological constructs.

Furthermore, the structural model fit the data in both cultures, providing general support for the self-determination model. The degree of autonomy-supportiveness of the work climate did predict overall need satisfaction in each culture, and need satisfaction in turn predicted both task engagement and well-being. Thus, by showing that satisfying these needs promotes motivation and mental health across cultures, results of the study are consistent with the view that these needs are universal. Still, of course, these results represent but one step in a process of confirming this fundamental aspect of self-determination theory.

The data also revealed interesting differences between experiences in the two cultures. Counter to what might be a stereotypic American view, workers in the state-owned companies of Bulgaria reported experiencing greater satisfaction of the need for autonomy than did workers in the American corporation. Furthermore, Bulgarians reported greater autonomy support from their immediate supervisors and in the immediate work context than did Americans. In fact, these findings were consistent with our impressions, derived from the observations and interviews we did with workers in more than a dozen Bulgarian work organizations. Although the work conditions appeared to be poorer than condi-

tions in comparable U.S. companies, the Bulgarian workers seemed to experience less pressure on their jobs and indicated that they even had some say in the selection of their supervisors. On the other hand, the data showed that Bulgarians reported experiencing less autonomy support from top management than did Americans. This, as well, was consistent with impressions, because Bulgarian workers seemed to be fearful of top managers who, in a sense, were closely aligned with government officials.

Results of the current study also showed some differences in the magnitude of relations between latent variables in the two cultures. Specifically, whereas the paths from need satisfaction to task engagement and from need satisfaction to self-esteem were equivalent in Bulgaria and the United States, the path from autonomy support to need satisfaction was stronger in the U.S. sample, and the path from need satisfaction to anxiety was stronger in the Bulgarian sample. It may be that, for Bulgarians, satisfaction of the basic needs was more influenced by factors beyond just managerial autonomy support than was the case for Americans. In other words, Americans' experience of need satisfaction at work may depend more on the managerial climate and less on other factors, such as peer relationships, contrary to the case in Bulgaria. Given that we found these cross-cultural differences in the strengths of relations in the model, future research will need to give greater attention to the sociocultural factors that influence people's experienced need satisfaction across cultures.

Various writers, such as Kao and Sek-Hong (1997), have criticized theories of motivation that focus on the goals and needs of individuals for being locked into Western ideology. For example, Boas (1991) suggested that current thinking about motivation in organizations tends to be self-serving, based on an individualistic conception of humans, and Bond (1988) proposed that such motivation theories may therefore be relevant only in mainstream America, a view that is not consistent with the results of the current study. Nonetheless, Kao and Sek-Hong (1997) proposed an alternative way of thinking about motivational issues in the workplace using the Eastern idea of moral obligation (e.g., Munro, 1977).

The criticisms and arguments of these writers involve two sources of confusion, at least with respect to self-determination theory. First, the very idea of enacting moral obligations brings one face to face with the concept of needs. It is individuals who enact (or fail to enact) moral obligations, and in so doing, individuals are satisfying (or failing to satisfy) their own needs. By enacting moral obligations volitionally, people are able to feel both related to their culture and autonomous in their actions. However, when individuals are nonvolitional in enacting moral obligations, they fail to experience need satisfaction (especially of the autonomy need) and poorer mental-health outcomes tend to accrue (e.g., Ryan, Rigby, & King, 1993).

Second, several writers who have made such criticisms have confused the concepts of individualism and autonomy. For example, in a discussion of different concepts of self that are affected by cultural values, Kashima, Yamaguchi, Kim, Choi, Gelfand, and Yuki (1995) described one type of self that is "individualistic, independent, autonomous, agentic, and separate" (p. 925). Their portrayal of autonomy as being essentially the same as individualism and independence is inaccurate with respect to self-determination theory's concept of autonomy. Autonomy within our framework means volition, the self-endorsement of one's actions or expressed beliefs. That does not imply individualism, independence, or separateness. Individuals may (and indeed when they are fully functioning, they often do) act autonomously in accord with the communal good, in an interdependent way that is agentic and very much connected to, rather than separate from, others. According to self-determination theory, it is perfectly consistent for individuals to be autonomously interdependent (e.g., Ryan & Lynch, 1989) and to autonomously embrace collectivist values and moral obligations. The need for relatedness or belongingness will be central to holding collectivist values and enacting moral obligations, as will the need for autonomy if the enactment of the group-oriented values is to be volitional and to promote well-being.

The relevance of these issues to the current research is that when autonomy is conceived of in terms of volition and self-endorsement, it is then a concern applicable to the practices and beliefs of all cultures. In the present study, it is clear that autonomy, operationalized in accord with self-determination theory, was, along with the other two basic needs, functionally relevant even within the work environments of state-owned companies in a culture that has traditionally operated with authoritarian regimes and moderately collectivist values. Although this demonstration does not confirm the universal significance of basis psychological needs, it does suggest the generalizability of these constructs beyond just the work cultures of mainstream America.

In conclusion, the present study provides evidence in support of the self-determination model of work motivation across two very different cultures and types of work organizations. More specifically, the results suggest that the study of basic psychological needs may be relevant across quite divergent cultures with different political, economic, and value systems. On the other hand, the data also suggest the importance of attending to differ-

ences in the means through which needs can be supported in different work contexts to promote the motivation and well-being of workers.

NOTES

1. This commentary about Bulgarian work organizations was synthesized from extensive interviews conducted in Bulgaria by the first two authors with more than four dozen people ranging from line workers in several companies to Presidents of major state-owned companies to high ranking officials in the Ministry of Labor.

2. A composite autonomy-support variable also was created that was comparable to the autonomy-support latent variable used in the EQS analyses. This was done by averaging the three autonomy-support variables after they had been standardized within country. Standardization was necessary because the response scales for the three variables were not all the same. This composite variable was used in the correlational analyses reported in Table 2 and also in multilevel modeling analyses. Multilevel modeling was done as a supplemental analysis to remove the effects of company within the Bulgaria sample before examining the paths of the structural model presented in Figure 1. Thus, because we did multilevel modeling only for the Bulgaria sample, it was important to create the autonomy support composite by standardizing within the Bulgaria data set. The resulting composite variable is the only standardized variable used in any analyses. Because the standardizing was done within the countries, the mean for overall autonomy support was 0 in each country; therefore, the means and standard deviations for this variable were not reported in Table 1.

3. In the analyses of the measurement and structural models, we used 4 individual items as indicators for the anxiety latent variable, 3 randomly selected sets of three items each as indicators for the work engagement latent variable, and 5 randomly selected pairs of items as indicators for the self-esteem latent variable. These 12 variables were not included in Tables 1 and 2 because they do not represent constructs in their own right. However, complete tables, including the means, standard deviations, and correlations for these variables, are available from the corresponding author.

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