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Testing Self-Determination Theory via Nigerian and Indian adolescents

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We tested the generalizability of five propositions derived from Self-Determination Theory (SDT; Deci & Ryan, 2000) using school-aged adolescents living in India ($N = 926$) and Nigeria ($N = 363$). Consistent with past U.S. research, perceived teacher autonomy-support predicted students' basic need-satisfaction in the classroom and also predicted positive class evaluations. The three basic needs of autonomy, competence, and relatedness also predicted positive class evaluations, and furthermore predicted students' general life-satisfaction. Also, balance among the three needs had positive associations with life-satisfaction independent of the amount of need-satisfaction. Finally, perceived maternal and paternal autonomy-support both predicted life-satisfaction. Support was also found for two demographic hypotheses: older students perceived less autonomy-support from parents and teachers, and Indian students reported greater life-satisfaction than Nigerian students.

Keywords: autonomy; India; Nigeria; Self-Determination Theory

Self-Determination Theory

Self-Determination Theory (SDT; Deci, 1972; Deci and Ryan, 1985, 2000; Sheldon, Joiner, & Williams, 2003) is a theory of optimal motivation that has been under development for nearly 40 years. The theory is based on the concept of intrinsic motivation; i.e., behavior undertaken because of the inherent interest and enjoyment it provides. Intrinsic motivation is said to represent the active organism's strivings toward mastery, development, and health; research has demonstrated that intrinsic motivation is desirable for many reasons (see Deci & Ryan, 2000, for a review). Unfortunately, intrinsic motivation is fragile and can be easily undermined when social-contextual circumstances do not support it (Deci, 1972). Thus, much of SDT focuses on the processes by which authorities such as teachers, parents, or coaches meet or thwart their subordinates' basic psychological needs, affecting the maintenance of intrinsic motivation and also the development of internalized motivation to perform behaviors that are not inherently interesting or enjoyable. We will now focus on several important concepts from SDT, before describing a study designed to examine the generalizability of past SDT findings to two under-studied cultural contexts.

The importance of autonomy-support

SDT proposes that autonomy-support is a crucial socio-contextual variable that influences peoples' ability to thrive and experience intrinsic motivation and satisfaction within a particular context. Authorities (i.e., mentors, parents, coaches, health providers) support the autonomy of subordinates (i.e., protégés, children, athletes, patients) when they try to under-

stand the subordinate's perspective, when they provide as much choice as possible in the setting, and when they provide a meaningful rationale when choice is not possible. When subordinates feel supported (rather than controlled), those subordinates are able to internalize prescribed behaviors into their sense of self, gaining a sense of agency and self-possession despite the influence of the authority. A broad assortment of studies has demonstrated the importance of authority autonomy-support for a wide variety of outcomes (see Deci & Ryan, 2000, or Ryan and Deci, 2008, for a recent overview of this literature).

The need for autonomy

The reason autonomy-support is so important, according to SDT, is that all humans have a need for autonomy and personal volition. In other words, the desire to feel a sense of self-agency and ownership may be a species-typical, evolved psychological need (Deci & Ryan, 2000). Over the past three decades, researchers within this tradition have amassed considerable evidence in support of this proposition within a wide variety of research contexts and life domains, including sports, counseling, education, medicine, personal goals, and politics. In addition to autonomy, SDT has proposed that competence and relatedness are also universal psychological needs, an idea that is consistent with other theoretical perspectives (e.g., Baumeister & Leary, 1995). Sheldon, Ryan, and Reis (1996); Reis, Sheldon, Gable, Roscoe, and Ryan (2000); and Sheldon, Elliot, Kim, and Kasser (2001) have all provided evidence to support SDT's proposed three needs, in that all three qualities of experience independently predicted mood, satisfaction, and other positive outcomes.

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But is autonomy universally beneficial?

Still, controversies remain – particularly regarding the proposed universality of the need for autonomy. Some cross-cultural theorists and researchers have suggested that the need for autonomy is primarily a Western phenomenon that is found only in individualist and independent cultures and should not emerge in collectivist and interdependent cultures in which group-centered norms and traditions predominate (Markus, Kitayama, & Heiman, 1996; Oishi & Diener, 2001). In such cultures, independent action (i.e. action not referenced to others) may be somewhat maladaptive and non-functional. However, SDT researchers have argued that autonomy should not be equated with independence; autonomy refers to self-responsibility and a sense of personal causation, whereas independence refers to social disengagement and non-reliance on others. Autonomy and independence can be quite different; for example, Kağıtçıbaşı (1996) stated that “autonomy does not necessarily mean distancing oneself from others, although such a meaning is commonly attributed to it” (p. 180). Again, when defined and measured in the way SDT proposes, autonomous volition is typically found to predict well-being and positive outcomes in any culture examined (Deci & Ryan, 2000; Ryan & Deci, 2006; Sheldon, 2004).

The aim of the current study was to further test the generalizability of SDT and its universalist assumptions by surveying large samples of high school-aged adolescents within India ($N = 926$) and Nigeria ($N = 363$) – two societies which have received little attention from cross-cultural researchers and no attention from SDT researchers. India and Nigeria were of interest to us because, although researchers generally agree that more research on collectivism is needed, the majority of published research has focused on East Asian samples (Japan, China, Korea) as representative of collectivism in general. Our inclusion of a southwest Asian (Indian) sample and an African sample afforded a unique opportunity to test the generalizability of SDT within samples not previously assessed by SDT researchers. An additional feature of the current study was its employment of an adolescent sample – a group which has received less attention from SDT researchers than have young adult samples.

In both countries we entered high school classrooms to assess students' perceptions of their teachers' autonomy-supportiveness, their felt need-satisfaction within the classroom, their overall evaluation of classes, and their general life-satisfaction. In addition, we asked each student to rate their mother's and father's autonomy-supportiveness within the home. This design allowed us to try to replicate five different hypotheses derived from past SDT research within non-Western samples, hoping to better establish SDT's claims of universal applicability.

First, we examined the associations of teacher autonomy-support with classroom need-satisfaction and positive course evaluations. Consistent with past research in the US (i.e., Black & Deci, 2000; Grolnick & Ryan, 1987; Williams & Deci, 1996), we expected that teacher autonomy-supportiveness (vs. controllingness) would be associated with these positive outcome measures. In other words, when teachers are perceived to care about the student's perspective and to offer the student choice where possible, then students should feel more satisfied in school and give a more positive evaluation of the class they are taking.

Second, we attempted to replicate Filak and Sheldon's

(2003, 2008) finding that feelings of autonomy, competence, and relatedness in the classroom each make independent contributions to predicting positive teacher-course evaluations. In other words, when students feel that they are able to make their own choices, be effective, and be meaningfully connected to others within a classroom, then they should also feel that the class as a whole is a good one. Filak and Sheldon (2003, 2008) used only American college-student samples in their studies, and thus it was important to establish whether their finding emerges within younger, non-Western samples as well.

Third, we examined whether classroom feelings of autonomy, competence, and relatedness each uniquely predict general life-satisfaction. Past research concerning “what's satisfying about satisfying events” (Sheldon et al., 2001) suggested that each of the three proposed SDT needs independently predicts positive mood within the rated event, within both American and South Korean samples. Also, Deci et al. (2001) showed that satisfaction of each of the three needs on-the-job uniquely predicted optimal work outcomes in both U.S. and Bulgarian samples (see also Baard, Deci, & Ryan, 2004). In the current study we hoped to conceptually replicate this pattern with younger participants from Nigeria and India, by examining the effects of autonomy, competence, and relatedness need-satisfaction in school upon general life-satisfaction. Because the school context is one in which students spend half their waking day, we reasoned that felt need-satisfaction within the classroom should influence general life-satisfaction beyond the classroom.

Fourth, we were able to test Sheldon and Niemiec's (2006) recent finding that the balance of need-satisfaction also predicts well-being. Sheldon and Niemiec showed in four studies that, controlling for the *amount* of autonomy, competence, and relatedness need-satisfaction, the degree of *balance* among these three qualities of experience independently predicted well-being. They found, for example, a person with a “5-5-5” profile is slightly happier than a person with a “6-6-3” profile, although the two people have the same need-satisfaction sum score of 15. Using life-balance theory (Adams, King, & King, 1996; Rice, Frone, & McFarlin, 1992), Sheldon and Niemiec (2006) argued that those experiencing unbalanced need-satisfaction are likely encountering role stresses and strains that detract from their well-being. In addition, Sheldon and Niemiec suggested that unbalanced need-satisfaction can result from excessive self-differentiation across life-roles (Donahue, Robins, Roberts, & John, 1993), in which one plays a very different character in different parts of one's life. Given that some cross-cultural research suggests that members of collectivist cultures do not suffer as much as Westerners from high self-differentiation across life-roles (Suh, 2002), it seemed important to try to generalize Sheldon and Niemiec's finding to non-Western samples. In addition, we thought it desirable to try to generalize Sheldon and Niemiec's findings to a younger age-group, given that those investigators examined only college students.

Fifth and finally, we examined the association of maternal and paternal autonomy-support upon students' general life-satisfaction. Consistent with past research on optimal parenting (see Grolnick, 2003, for a summary), we expected that both parental support variables would positively predict students' general life-satisfaction. This prediction is grounded in the same reasoning offered earlier regarding teacher autonomy-support.

Considering student age

Might student age have main effects upon any of the measured constructs, or moderator effects upon the five main-effect hypotheses enumerated above? Some SDT studies have used student samples (see Grolnick, 2003 for a review), but very few of these studies have reported age effects. Some SDT studies suggest that older people tend to feel more autonomous and satisfied, reflecting an inherent maturational process and the increasing establishment of identity (Chandler & Connell, 1987; Sheldon & Kasser, 2001). However, other studies suggest that older students might chafe under the perceived restrictiveness and irrationality of powerful adults. For example, Smetana, Campione-Barr, and Daddis (2004) found that older adolescents wanted more autonomy than parents were willing to give them. Gutman and Eccles's stage-environment fit theory (2007) specifies that environments may not fit the adolescent's developmental stage; i.e., adults may be unwilling to grant as much autonomy as older adolescents may like. Laursen, Coy, and Collins' 1998 meta-analysis showed that parent-child conflict increases between early and middle adolescence, and Furman and Buhrmester (1992) reported that adolescents' perceptions of supportive relationships with parents decreased from late childhood to middle adolescence. Thus, it is possible that student age will be negatively correlated with perceived autonomy-support by parents and teachers.

Comparing India and Nigeria

India and Nigeria share many features. They both, for example, are home to a large variety of ethnicities, religious views, and languages (approximately 325 in India and 400 in Nigeria; Chhokar, 2008; Metz, 1992). Both are considered collectivist societies (e.g., in Diener, Diener, and Diener (1995), India was tabled as a "6" on a 1–10 collectivism scale, and Nigeria a "7"), and both represent traditionally agrarian nations which also contain very large cities (e.g., Calcutta, Lagos). Perhaps most strikingly, however, India and Nigeria both endured centuries of colonial occupation under the rule of Great Britain and established their independence at around the same time: 1960 for Nigeria and 1947 for India (Chhokar, 2008; Metz, 1992). Thus, there is reason to expect strong similarities between the two countries.

However, there is also reason to expect differences: almost immediately after gaining independence from Great Britain in 1960, Nigeria fell into political dissent resulting in a series of coups, long periods of military rule, and a civil war that claimed millions of lives (Metz, 1992). After military rule proved to be ineffective, Nigeria drafted and put into place a democratic constitution in 1989 which specified civilian control of the country. Since that time, Nigeria has attempted to live out its democratic ideals but has encountered difficulty establishing order and consistent governance (Maier, 2000). This is due, in large part, to the rampant poverty and corruption that has defined the daily life and national politics of Nigeria (Maier, 2000). In addition, Nigeria's numerous economic downturns, volatile oil industry, and lagging industrialization efforts have yielded high unemployment rates, low education standards, and dissatisfaction among the populace (Maier, 2000; Saiyadain, 1985). Indeed, there is some anecdotal evidence to suggest that the chaos evident in Nigeria's political system has

corroded the infrastructure of some social institutions, including education (Maier, 2000).

In contrast, India has embarked upon a more stable course since gaining independence in 1947. During this time, the new power structure set about consolidating its many independent territories under one nation, ruled by democratic principles (Chhokar, 2008). Unlike Nigeria, the structure of this initial vision has remained largely intact despite frequent incidents of ethnic and sectarian violence (most notably between majority Hindus and minority Muslims; Chhokar, 2008). Many reports suggest that country unity has been influenced by increased industrialization efforts and a recent economic boom (Banerjee, 2008; Saiyadain, 1985). Poverty and corruption continue to be a problem in India, but the situation is far worse in Nigeria – Nigeria was ranked 147 out of 179 countries while India was ranked 72, in a poll of perceptions of corruption (see http://www.transparency.org/policy_research/surveys_indices/cpi/2007). Many of the social institutions left over from the British occupation have remained undisturbed in India, such as the education system which is largely modeled after the British system (Chhokar, 2008). In sum, both Nigeria and India are prime exemplars of developing countries that play important roles on the current global stage.

Again, SDT claims to identify universally relevant processes. Thus, despite the differences described above, we expected our five SDT hypotheses to be supported within both samples; i.e., there would be no interactions involving sample. Still, our Hypothesis 7 predicted that those in the Indian sample would appear somewhat more satisfied with their lives, given the social-structural differences reviewed above. In general, societies that lag behind in subsistence income and stability produce less satisfied citizens (Inglehart, 2006).

Summary and hypotheses

In sum, we attempted to replicate five recent SDT-based findings within two large non-Western and adolescent samples. Using regression analyses, we hypothesized that: 1) teacher autonomy-support would predict greater autonomy, competence, and relatedness need-satisfaction within the classroom, and also higher course evaluations (Black & Deci, 2000); 2) each of the three needs would independently predict positive course evaluations (Filak & Sheldon, 2003); 3) each of the three needs would independently predict general life-satisfaction (Sheldon et al., 2001); 4) the balance of student need-satisfaction would predict general life-satisfaction over and above the main effects of the three needs (Sheldon & Niemiec, 2006); and 5) mother's and father's perceived autonomy-support should both predict general life-satisfaction (Grolnick, 2003). We also hypothesized that 6) student age would correlate negatively with perceived autonomy-support by parents and teachers; and that 7) the Indian sample would be higher in life-satisfaction.

Methods

Sample and procedure

In late 2005 a research assistant (RA) visited eight different secondary schools in Nigeria, primarily within the state of Lagos, near the capital, Abuja. The schools varied from 400

to 1,500 in enrollment, and were located in rural and urban areas, with the urban schools having somewhat greater enrollment and containing somewhat better facilities. The RA visited one or more classrooms in each school, distributing and then collecting completed questionnaires. A total of 363 Nigerian students provided complete data on all the major study variables. Of these, 159 were girls and 204 were boys, and ages ranged from 9 to 20 years, with a mean of 14.15 ($SD = 1.84$; 41 students were excluded because of incomplete data). In summer 2006, a different RA visited eight secondary schools in India, within the northeast state of Maharashtra. These schools varied from 150 to 4,000 in enrollment; all schools bar one were located in areas with populations of 500,000 or more. In each school one or more classrooms were visited, in which questionnaires were completed and returned by students. A total of 926 Indian students provided complete data. Of these, 409 were girls and 517 were boys, and ages ranged from 12 to 18 years, with a mean of 14.36 ($SD = 1.48$; 17 students were excluded because of incomplete data). Notably, attrition analyses revealed that the relatively few excluded participants within each sample did not differ from the main sample on any of the complete study variables. We also conducted age outlier analyses and found that excluding nine participants younger than 11 or older than 18 made no difference in the results; therefore we included all students in the analyses below.

All questionnaires were administered in English, which was the primary language of instruction in every school in both countries. We employed mean or modal substitution to deal with scattered missing demographic data, in order to retain the final sample of 1,289 with complete data on all substantive variables.

Measures

Demographics. In addition to providing details of their gender and age, participants were asked about their mothers' and fathers' education level on a scale ranging from "primary school" to "secondary school" to "some college/tech school" to "completed college." The modal score for mothers was "secondary school" and for fathers it was "completed college." In addition, participants were asked "How much money does your family have, compared to other kids in your school?" They answered using a scale ranging from "much less" to "less" to "about the same" to "more" to "much more." This scale allowed us to compare the effects of having relatively more or less family resources compared to other members of the sample, bypassing country-level differences in currency and average income. The modal score was "about the same." Sex, age, mother's and father's education, and income are employed as co-variables in the primary hypothesis tests.

Teacher and parental autonomy-support. We employed the 15-item Learning Climate Questionnaire (Black & Deci, 2000; Williams & Deci, 1996) to assess teacher, paternal, and maternal autonomy-support. If the child was not living with the mother or father, he/she was asked to rate the adult who came closest to fulfilling this role for them. The measure was administered with a scale of 1 (not at all true) to 5 (very true), and contained statements such as "I feel that my teacher/mother/father provides me choices and options" and "My teacher/mother/father listens to how I would like to do things." Teacher, mother, and father autonomy-support variables were

computed by averaging the relevant items after appropriate recoding ($\alpha = .82, .84, \text{ and } .87$).

Course evaluation. To assess students' course evaluation we used two of the items employed by Filak and Sheldon (2003), which are also used by the University of Missouri to evaluate overall class quality. Participants rated their agreement with the statements "Overall, this is an excellent class" and "I would recommend this class to a friend." The measure was administered with a scale of 1 (not at all true) to 5 (very true), and a course evaluation variable was computed by averaging the two responses ($\alpha = .70$).

Classroom need-satisfaction. To assess classroom need-satisfaction we employed the nine items used by Sheldon et al. (2001): three each for autonomy, competence, and relatedness need-satisfaction. All items were prefaced with "In my class," followed by statements such as ". . . my choices are based on what interests me and on what I value" (autonomy), ". . . I feel that I am successfully completing difficult tasks and projects" (competence), and ". . . I feel close and connected with other people who are important to me" (relatedness). The measures were administered with a scale of 1 (very slightly) to 5 (extremely); and autonomy, competence, and relatedness need-satisfaction scores were computed by summing the relevant items ($\alpha = .45, .43, \text{ and } .57$). These alpha coefficients were unexpectedly low and will be considered further below.

Balance of need-satisfaction. To assess the balance of satisfaction within the classroom, we used the computational procedures of Sheldon and Niemiec (2006). Specifically, the absolute difference between each pair of needs was computed, and these three differences were then summed with higher scores indicating greater imbalance versus balance. For example, a person with scores of 4, 5, and 6 on the three need-satisfaction variables would receive an imbalance score of 4, and a person with scores of 2, 5 and 6 would receive an imbalance score of 8. In testing hypotheses concerning this variable we controlled for the three needs (i.e., the overall amount of need-satisfaction) in order to ensure that the balance effect is independent of need mean levels or distributional characteristics (Sheldon & Niemiec, 2006).

Overall life-satisfaction. To assess general life-satisfaction we used the five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), which contains items such as "the conditions of my life are excellent" and "I am satisfied with my life." The measure was administered with a scale of 1 (very slightly) to 5 (extremely), and an aggregate life-satisfaction score was computed from the five responses. Surprisingly, given that the measure is well-validated and frequently employed, coefficient alpha was .41.

Given the low internal consistency estimates for several of our measures, it was necessary to further explore their adequacy for our purposes. Specifically, we conducted a multiple groups confirmatory factor analysis for each of the eight study measures (three autonomy-support measures, three need-satisfaction measures, life-satisfaction, and course evaluation) to evaluate measurement equivalence within India and Nigeria. These analyses revealed that a single factor adequately fitted each measure, and also showed that freeing the equality constraint across the two samples did not improve the fit of the

model (all $ps > .15$), with one exception: for the relatedness need-satisfaction variable, the chi-square difference test with two degrees of freedom was significant ($p = .018$).

We also conducted further psychometric evaluations by computing item-total correlations for each item in the four problematic scales. For the three autonomy items, item-total correlations ranged from .25 to .30 in the full sample and were nearly identical across the two groups; for the three competence items, these ranged from .21 to .30 – again nearly identical across groups. Although item-total correlations for the three relatedness satisfaction items ranged from .38 to .40 in the full sample, these correlations ranged from .36 to .38 in India and ranged more broadly from .35 to .43 in Nigeria, explaining why freeing the culture parameter in the multiple groups analysis (described earlier) produced a somewhat better fit. Notwithstanding this difference, taken together, these results suggest that the three need-satisfaction constructs were coherently measured across cultural groups, but perhaps would have required more items to reach conventional reliabilities. Thus in Table 1, we report dis-attenuated as well as uncorrected coefficients for all hypothesis-relevant correlations involving these three measures.

For the five-item life-satisfaction measure, item four (“If I could live my life over, I would change almost nothing”) performed poorly in the full sample (item-total correlation = .08), and was also the worst item within each group. We considered deleting this most abstract item from the scale, as the student sample may not have fully comprehended it. However, because the pattern of significant results was the same either way, we decided to retain the full published scale in the analyses. Still, in Table 1 we report dis-attenuated as well as raw coefficients for the hypothesis-relevant correlations involving the life-satisfaction measure.

Finally, we made two further attempts to understand the low reliabilities. First, we speculated that the young age of the participants might have influenced their ability to understand the more abstract items. If so, then the reliabilities for the problematic scales should have been systematically higher among older participants. However, this was not the case: although reliabilities varied somewhat across age groups, there was no evident linear trend by age. Second, we speculated that

need-satisfaction issues may be less salient or accessible in these participants from relatively poor countries. In terms of Maslow’s need hierarchy (Maslow, 1987), because they lack somewhat in basic needs for food and shelter, these participants may be less discriminating or responsive regarding higher-order, more psychological needs. If so, then the reliabilities for the problematic scales should have been systematically higher among participants with higher socio-economic status (SES) than those with lower SES. However, this was not the case: although reliabilities varied somewhat across SES levels, there was no evident linear trend by SES. In sum, the low alphas of these measures are not well understood and this issue requires further examination (e.g., using thinking-aloud protocols while Indian and/or Nigerian participants respond to the questions).

Results

Preliminary results

Preliminary analyses revealed that there were some modest mean-level differences among the eight schools within each country. However, these differences did not co-vary with the rural versus urban status of the schools or the assistant-rated quality of the school facilities, and centering the school means within country did not affect the results; thus we ignore these differences.

Table 1 presents the sample means, standard deviations, and zero-order correlations for the primary study variables. All correlations relevant to hypotheses were significant in the expected direction (again, we use regression tests to formally test the hypotheses). As noted earlier, Table 1 also contains correlations corrected for measurement error for all hypothesis-relevant correlations involving the four problematic scales. As can be seen, these 13 dis-attenuated correlations were substantially larger, especially in the case of the need-satisfaction to life-satisfaction relationships, and they probably better estimate the true relationship between the constructs, given their similarity in magnitude to past published research (Filak & Sheldon, 2003; Grolnik, 2003).

Table 1

Means, standard deviations, and correlations among major study variables

	Mean	SD	1	2	3	4	5	6	7	8
1. Teacher autonomy-support	3.76	.71								
2. Autonomy need-satisfaction	3.41	.92	.21							
			(.35)							
3. Competence need-satisfaction	3.69	.80	.32	.36						
				(.54)						
4. Relatedness need-satisfaction	3.94	.90	.30	.30	.34					
					(.44)					
5. Course evaluation	3.90	1.07	.42	.13	.15	.24				
				(.23)	(.27)	(.38)				
6. Mother autonomy-support	4.42	.53	.34	.17	.24	.23	.16			
7. Father autonomy-support	4.32	.67	.38	.08	.24	.18	.20	.48		
8. Unbalanced need-satisfaction	2.55	1.41	-.09	-.41	-.16	-.05	-.03	-.08	-.05	
9. Life-satisfaction	3.49	.68	.23	.29	.32	.31	.19	.28	.29	-.16
				(.68)	(.76)	(.64)	(.35)	(.48)	(.49)	

Note. Correlations of .06 or greater are significant at the .05 level; correlations of .08 or greater are significant at the .01 level. The correlations in brackets are hypothesis-relevant correlations corrected for measurement error.

T-tests revealed that the Indian and Nigerian samples differed on seven of the nine variables. Again, Hypothesis 7, which we will turn to first, stated that the Indian sample would be higher in life-satisfaction; this was indeed the case ($M_s = 3.54$ vs. 3.38 , $t(1287) = 3.72$, $d = .20$, $p < .01$). In addition, the Indian sample was higher than the Nigerian sample in classroom relatedness need-satisfaction ($M_s = 4.00$ vs. 3.79 , $t(1287) = 3.76$, $d = .21$, $p < .01$) and need-imbalance ($M_s = 2.61$ vs. 2.39 , $t(1287) = 2.50$, $d = .14$, $p < .05$). However, the Nigerian sample was higher than the Indian sample on perceived teacher autonomy-support ($M_s = 3.87$ vs. 3.72 , $t(1287) = 3.50$, $d = .20$, $p < .01$), classroom autonomy need-satisfaction ($M_s = 3.16$ vs. 3.33 , $t(1287) = 5.14$, $d = .29$, $p < .01$), classroom competence need-satisfaction ($M_s = 3.78$ vs. 3.65 , $t(1287) = 2.51$, $d = .14$, $p < .05$), and maternal autonomy-support ($M_s = 4.50$ vs. 4.39 , $t(1287) = 3.58$, $d = .20$, $p < .01$). We will attempt to interpret these non-hypothesized differences in the discussion section. Because of these differences, country was included as a covariate in all of the SDT hypothesis tests. In addition, country \times predictor interaction terms were included in all regression hypothesis tests.

SDT hypothesis tests

Hypothesis 1. Hypothesis 1 stated that perceived teacher autonomy-support would predict rated autonomy, competence, and relatedness need-satisfaction within the classroom, and also predict a more positive evaluation of the class. To test this hypothesis we regressed each of the four dependent measures upon teacher autonomy-support and also the five demographic covariates of sex, age, mother's education, father's education, and family income. In addition, a dummy variable was included to code for country of origin. At step 2 in each analysis we entered a country by (centered) teacher autonomy-support product term, to evaluate whether the association between teacher autonomy-support and each outcome variable differs between countries.

Table 2 presents the standardized beta coefficients resulting from these four analyses. As predicted, teacher autonomy-

support was significant in all four analyses, supporting Hypothesis 1. There were scattered and small effects for the demographic variables; these did not form a consistent pattern and are not discussed here. One of the interaction terms was significant at the second step ($\beta = .30$, $p < .05$); teacher autonomy-support was somewhat more strongly associated with classroom autonomy need-satisfaction in India than in Nigeria. This was manifested in the somewhat different correlations observed in the two samples ($r = .24$, $p < .01$ in India vs. $r = .13$, $p < .05$ in Nigeria).

Hypothesis 2. Hypothesis 2 stated that each of the three needs would independently predict positive course evaluations (Filak & Sheldon, 2003). To test this we regressed course evaluation upon country and the same five demographic variables as above. In addition we entered the three need-satisfaction variables at the same step. In this analysis older students evaluated the class less positively ($\beta = -.13$, $p < .01$), as did students whose fathers were more educated ($\beta = -.09$, $p < .01$); none of the other demographic variables (including country) was significant. More importantly, the autonomy, competence, and relatedness effects were each significant (although small; $\beta_s = .07$, $.06$, and $.19$, $p_s < .05$, $.05$, and $.01$, respectively), supporting Hypothesis 2. Also, the overall equation was significant ($R^2 = .086$, $p < .01$). No significant interactions between country and the needs emerged at a second step of the regression, indicating that the three needs had equivalent associations with course evaluations in each sub-sample.

Hypothesis 3. Hypothesis 3 tested the same model as Hypothesis 2, this time with general life-satisfaction as the dependent measure. In this analysis country had a significant effect ($\beta = .14$, $p < .01$), such that Indian students were higher in life-satisfaction than Nigerian students (as already shown in the mean difference tests earlier). Also, students with a higher family income were more satisfied ($\beta = .07$, $p < .01$). Most importantly, autonomy, competence, and relatedness need-satisfaction were each significant ($\beta_s = .19$, $.19$, and $.18$, respectively, all $p_s < .01$), as hypothesized. Also, the overall

Table 2

Standardized coefficients resulting from regressions of autonomy, competence, relatedness, and course evaluation on teacher autonomy-support and demographic variables (Step 1) and a country by teacher autonomy-support product interaction term (Step 2)

	Dependent variable			
	Autonomy-satisfaction	Competence-satisfaction	Relatedness-satisfaction	Course-evaluation
Step 1 predictors				
Country	-.11**	-.03	.13**	.03
Sex	.07	.02	.01	-.05*
Age	.10**	-.03	-.02	-.09**
Mother's education	.07*	-.02	-.03	.00
Father's education	.04	.10**	.04	.05
Family income	.00	.01	-.02	-.01
Teacher's autonomy-support	.22**	.32**	.31**	.42**
Step 2 predictor				
Country \times teacher's autonomy-support	.30*	.08	-.18	.05
Overall R^2	.08**	.11**	.11**	.19**

Note. * $p < .05$; ** $p < .01$.

equation was highly significant ($R^2 = .198, p < .01$). Once again, no significant interactions emerged involving country and the three needs at a second step of the regression, indicating that the three needs had equivalent associations in each sub-sample.

Hypothesis 4. Hypothesis 4 stated that unbalanced need-satisfaction would have significant negative associations with life-satisfaction, even after the main effects of the three needs were controlled. To test this we re-conducted the Hypothesis 3 analysis, entering imbalance at the second step. The effect was negative and significant, as hypothesized (although small: $\beta = -.07, p < .05$). Also, the overall equation was highly significant ($R^2 = .202, p < .01$). Entering a country \times imbalance product term at the third step revealed that there was no interaction; that is, the association of imbalance with reduced life-satisfaction was equivalent in the two sub-samples.

Hypothesis 5. Hypothesis 5 stated that maternal and paternal autonomy-support would each predict student life-satisfaction. To test this we regressed the life-satisfaction measure upon country, the five demographic variables, and the two autonomy-support variables. In this analysis Indian students were again higher in life-satisfaction than Nigerian students ($\beta = .13, p < .01$), and students with more educated fathers and with greater family income were also more satisfied ($\beta_s = .07$ and $.05$, respectively, $ps < .05$). More importantly, both maternal and paternal autonomy-support made independent contributions to life-satisfaction ($\beta_s = .19$ and $.19$, both $ps < .01$), as predicted. Also, the overall equation was significant ($R^2 = .135, p < .01$).

Interestingly, entering two country \times autonomy-support product terms at a second step of this regression revealed significant country \times predictor interaction effects for both maternal and paternal autonomy-support ($\beta_s = .47$ and $.51$, respectively, $ps < .05$ and $.01$, respectively). Among Nigerian students, maternal and paternal autonomy-support correlated $.18$ and $.16$ with general life-satisfaction (both $ps < .01$), whereas these two correlations were $.36$ and $.37$ among the Indian students (both $ps < .01$). Thus, all three perceived autonomy-support variables (teacher, mother, and father) had stronger associations with at least one outcome variable in India than in Nigeria. Possible reasons for this will be considered later. For the reader's information, maternal autonomy-support and paternal autonomy-support did not themselves interact to predict life-satisfaction.

Hypothesis 6. Finally, we examined the association of student age with rated autonomy-support. Student age ranged from 9 (three students) to 20 (one student), with a mean of 14.3 and a mode of 13. In the full sample, age was negatively correlated with perceived teacher, mother, and father autonomy support ($r_s = -.11, -.10$, and $-.09$, respectively, $ps < .01$), as hypothesized. In addition, age was also negatively correlated with felt competence in the classroom ($r = -.08, p < .01$) and overall life-satisfaction ($r = -.08, p = .01$), and older students gave a less positive evaluation to the class overall ($r = -.12, p < .01$). Together, these results support our supposition that older students feel more controlled by adults and are less satisfied with their classroom experience and their lives (Grolnick, 2003; Gutman & Eccles, 2007; Smetana et al., 2004). Of course, inferences regarding developmental processes must be quite tentative given the cross-sectional study design. Notably,

age did not interact with any of the other hypothesis tests, suggesting that the processes specified by SDT are equally applicable regardless of student age.

Discussion

These data provided new support for five different hypotheses derived from Self-Determination Theory (SDT) and from recent findings within the SDT tradition, and they also supported two non-SDT hypotheses. The data are significant in part because of the South-Asian and African samples employed. The fact that these two collectivist cultures differ in important ways in their history and current situation allows an important new test of SDT's claims of universal applicability. In addition, adolescent samples were employed – a somewhat understudied group within past SDT research. Each hypothesis will now be considered separately.

First, consistent with past findings in the educational psychology literature (i.e., Black & Deci, 2000; Grolnick & Ryan, 1987), perceived autonomy-support from the teacher was associated with positive course evaluations and with experienced need-satisfaction within the classroom (Hypothesis 1). In other words, teachers who are seen to listen to their students, take their perspective, and provide choice whenever possible produce happier pupils and receive higher course evaluations. In contrast, teachers who exert rigid control without regard to the students' perspective may fail to provide an optimal educational environment.

Hypothesis 2 stated that classroom autonomy, competence, and relatedness need-satisfaction would each be associated with positive course evaluations (Filak & Sheldon, 2003, 2008). This hypothesis also received support. Still, the autonomy and competence effects were quite small (while the relatedness effect was somewhat larger). Notably, analyses correcting for measurement attenuation yielded coefficients equivalent in pattern and magnitude to those observed in the past (Filak & Sheldon, 2003, 2008), suggesting that these measurement issues only weakened, but did not bias, the results. Further research is warranted to understand what students in these two countries expect and consider when they are asked to evaluate their educational experience.

Hypothesis 3 concerned the unique positive associations of each of the three classroom need-satisfaction variables with general life-satisfaction. This hypothesis was also supported, with effects that were stronger than above and of approximately equivalent size for the three needs. This result is quite consistent with prior cross-cultural research concerning need-satisfaction and well-being (Deci et al., 2001; Sheldon et al., 2001) and again supports SDT's postulate that these are universal, species-typical, and perhaps evolved human needs. Although the idea that there are basic human needs for relatedness (i.e., belongingness, connectedness) and competence (i.e., effectance, self-efficacy) is relatively well accepted, again, the universal importance of autonomy has been considerably more controversial (Oishi & Diener, 2001). The current results indicate that when autonomy is conceptualized and measured in the way SDT suggests, rather than conceptualized and measured as psychological independence or social distance (Kağıtçibaşı, 1996), then it may indeed be important for all people, regardless of their age or cultural origin.

Hypothesis 4 concerned the effects of unbalanced need-satisfaction. Consistent with the recent findings of Sheldon and

Niemiec (2006), participants with a more variable profile of need-satisfaction reported somewhat reduced general life-satisfaction compared to participants with the same sum score of need-satisfaction whose profile was less variable. Although this effect was small, it was approximately of the same magnitude as those reported by Sheldon and Niemiec (2006) and did not vary across the two sub-samples. Again, Sheldon and Niemiec speculated that the imbalance effect reflects the accumulated stresses and strains associated with life imbalance. However, future research is needed to document such mediators. The contribution of the present data is to show that the imbalance effect can be found in non-Western as well as Western samples, and also that it can be found in an adolescent sample.

Hypothesis 5 concerned the positive effects of perceived maternal and paternal autonomy-support upon general life-satisfaction. Consistent with past findings (Grolnick, 2003), these two effects were indeed uncovered in both sub-samples. This confirms research conducted primarily in the West showing that parental autonomy support is associated with positive child outcomes (Grolnick, 2003).

In sum, all five of the SDT study hypotheses received support. In addition, Hypothesis 6 (that student age would be negatively associated with perceived teacher, mother, and father autonomy support) was supported. The latter negative correlations support some researchers' suggestion that older students chafe under the perceived restrictiveness of adults and would perhaps prefer to receive more freedom than parents and authorities are prepared to give them (Grolnick, 2003; Gutman & Eccles, 2007; Smetana et al., 2004). Consistent with the general pattern, student age also predicted less life-satisfaction, less felt competence in the classroom, and a less positive class evaluation. Notably, it is possible that these differences reflect age \times environment interactions rather than age differences per se, as older students may be confronted with a context that does not meet the demands associated with their increased maturity. The fact that satisfaction decreases with age could indicate that India and Nigeria have adopted cultural practices that do not entirely meet older youths' needs, perhaps because they both adopted the British educational system after gaining independence. Of course, further research will be required to investigate this conjecture.

Finally, Hypothesis 7 concerned a life-satisfaction difference between the two samples. The hypothesis that Nigerians would evidence less life-satisfaction, based on the greater poverty, corruption, and instability of Nigerian society, was supported. Interestingly, however, Nigerian students reported significantly greater teacher and maternal autonomy-support, and also reported greater autonomy (and competence) need-satisfaction in the classroom. The fact that autonomy needs may be overall better satisfied in Nigeria may help to explain why variations in authority autonomy-support had smaller (but still significant) effects upon some outcomes within Nigeria: because autonomy is not as much of an issue for them. In contrast, within India, where students seemed to feel more controlled in general, variations in authority autonomy-support appeared to make a bigger difference. Taken together, these results suggest that teachers and parents in Indian society may be slightly more controlling, that Indian adolescents therefore feel less autonomous and competent, and thus that autonomy-support, when it is received, has larger effects. Of course, further research will be needed to substantiate this interpretation of the data. It is also noteworthy that the

differences in the (significant) correlations between the two countries were not large and perhaps should not be over-interpreted.

Again, SDT claims that the needs for autonomy, competence, and relatedness are evolved and species-typical psychological needs that all humans require in order to thrive, just as they have certain physical needs that must be met. The argument is that in our ancestral past, those who needed and benefited from the experiences of doing what one internally assents to do (autonomy), doing it well (competence), and connecting with others in the process (relatedness), gained survival and reproduction benefits (Deci & Ryan, 2000). For example, those with a strong need for autonomy should be better able to resist group or social pressures counter to their own best interests; those with a strong need for competence should be better able to learn and to function in effective and adaptive ways; and those with a strong need for relatedness should be able to form strong attachments and cultivate mutually beneficial interpersonal and group relationships (Deci & Ryan, 2000; Sheldon, 2004). Although the evolved basis of the psychological needs is difficult to prove, finding that the three experiences have similar correlates in a wide range of cultures and populations provides one type of supportive evidence. An important contribution of the current study is showing that such effects emerge within these understudied cultural and demographic groups.

There were several important limitations of this study. First, measurement of the satisfaction variables was somewhat problematic, as discussed above. It is worth noting, however, that the predicted effects were found despite these difficulties; this might be taken as affirmation of the robustness of SDT's concepts and predictions. Another limitation concerns the lack of non-self-report information concerning contextual autonomy-support. Because two people may perceive the same target figure very differently, the effects of perceived autonomy-support may reflect personality differences as much as objective contextual differences (Deci & Ryan, 2000). Yet another limitation is the one-shot concurrent design, which likely confounds country differences in general scale usage with country differences in actual experience. Repeated measures or longitudinal studies of within-subject variation in need-satisfaction and well-being are necessary to control for such country-level differences in baseline scale usage (Reis et al., 2000).

Still, we believe these results offer solid support for SDT's claims of universal applicability, supporting the robustness of the theory. All of the predicted positive effects were significant (though sometimes modest). More importantly, none of the negatively-signed effects that one might expect emerged, if one accepts the suggestion, made by some theorists, that feelings of autonomy should actually have negative effects within cultures that traditionally devalue or discourage individual initiative (Markus et al., 1996). Instead, the results merely revealed cultural differences in the magnitude of the positive effects of autonomy-support – differences that can hopefully be explained by future research.

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