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Student Psychological Need Satisfaction and College Teacher-Course Evaluations

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ABSTRACT *Two studies examined student psychological need satisfaction as a predictor of positive teacher-course evaluations. In Study 1, 268 undergraduates recalled and rated the quality of a recent important college course, then rated their feelings of autonomy, competence, and relatedness within that course. Consistent with self-determination theory, all three ratings predicted instructor and/or course ratings. Study 2 found the same pattern in a sample of 179 introductory journalism students nested within 12 sections of a single course. Study 2 also evaluated instructor characteristics as predictors of mean levels of student need satisfaction across the 12 classes. Although instructor age and overall teaching experience were unrelated to students' need satisfaction, greater experience teaching their particular class negatively predicted student autonomy and relatedness need satisfaction. Implications for pedagogical practice are discussed.*

Introduction

The topic of this article should be of interest to most academics: what makes college students especially like and value a course that they have just taken? In other words, what factors drive positive teacher-course evaluations?

Although much research has examined this question (Best & Addison, 2000; Centra, 1973, 1977; Feldman, 1976, 1986; Marlin, 1987; Marlin & Niss, 1980; Schmelkin, Spencer, & Gellman, 1997), there is still little consensus as to what will help students form the most positive assessments of their classes and their instructors. For example, knowledge, enthusiasm, organisation, classroom management, fairness, openness and encouragement are positively correlated with students' views of good teaching (Feldman, 1976). The levels of learning value, instructor enthusiasm, group interaction, individual rapport, clarity, coverage, grading, and workload have also been shown to predict ratings of college teachers (Marsh, 1987). The list could go on (see Centra, 1996; Feldman, 1996; Marsh, 1991; Sherman, Armistead, Fowler, Barks-

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dale, & Reif, 1987). In light of these findings, the question then becomes: might there be a "shortlist" of common factors or causes underlying this bewildering diversity?

There is also controversy in the literature regarding interpersonal issues such as, should college teachers try to be well-liked by their students? Although some research suggests that warmth and a good sense of camaraderie make for an enjoyable learning experience (Best & Addison, 2000), it has also found that these qualities in a teacher do not necessarily correlate to perceived teaching effectiveness. Sheehan and DuPrey (1999) showed that the informativeness of the class was the most important factor in students' assessments of it as worthwhile, suggesting that forming relationships with students might be beside the main point.

What, then, do students really need to thrive in their courses? In the present article, we try to answer this question through the use of Deci and Ryan's (1985, 2000) self-determination theory. Self-determination theory is an organismic theory of optimal human motivation, extensively supported in the last three decades by studies in the fields of education, sport, work, wellbeing, and personal goals. As will be discussed below, in addressing what it is that people really need in order to thrive, contemporary self-determination theory makes strong assumptions about three proposed universal psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2000).

First, a brief historical review: self-determination (SDT) researchers have long been concerned with factors that undermine or support peoples' intrinsic motivations to engage in a behaviour (Deci, 1971). This is a natural question to ask in the classroom and, indeed, the theory has been extensively applied within the field of education, especially primary and secondary school education – for reviews, see Ryan and Stiller (1991) or Sheldon and Biddle (1998). In this educational research, the autonomy supportiveness of teachers (defined below) has been shown to be very important for maximal learning, growth, and creativity of students.

Only one prior SDT study has examined teacher effectiveness at the postsecondary level. Specifically, Black and Deci (2000) showed, consistent with primary school data, that students' perceptions of autonomy support from their instructors predicted increases in self-regulation, perceived confidence in the subject, and a decrease in anxiety regarding a course grade. However Black and Deci did not assess teachers' support of the two other needs specified by SDT, namely, competence and relatedness. Given that contemporary SDT increasingly relies on all three needs in both research (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Elliot, Kim, & Kasser, 2001) and theorising (Deci & Ryan, 2000), we believed that an investigation of all three needs as predictors of college teacher-course evaluations was in order. Below, we consider each need in turn.

Autonomy, as defined by Deci and Ryan (1985), occurs when people feel they are the cause of their behaviour, that is, when they feel a sense of whole-hearted volition in their choices. Autonomy is not independence or total freedom, but rather an internal acceptance of, and engagement with, one's motivated behaviour. Supporting autonomy means taking the student's perspective, providing choice, and providing a meaningful rationale when choice is not possible.

Competence occurs when one feels effective in one's behaviour. In other words, competence can be seen when one is taking on and mastering challenging tasks. Competence is closely akin to self-efficacy, and of course, it is well known that many students lose or fail to develop self-efficacy within educational settings (Dweck, 1999)

Supporting competence means conveying confidence in the student's ability to surmount challenges, and providing sensitive mentoring and feedback.

Relatedness occurs when one feels connected to or understood by others. Relatedness is akin to the need for belongingness posited by Baumeister and Leary (1995), but it is more general, including interpersonal as well as group connections. In the case of the teacher-student relationship, relatedness support means providing acceptance, respect, and a feeling of caring and mutuality.

According to SDT these three needs, when satisfied, promote psychological well-being (Reis et al., 2000) and enable optimal functioning and performance. In contrast, when an individual's environment or personality style does not afford these kinds of experiences, the person fails to thrive. Also, the needs are additive: an individual is best off when all three are present, and worst off with none present. Ryan (1995) used the analogy of a plant, which needs water, minerals and light in order to thrive. Depriving the plant of any one of these will reduce thriving in the plant, and providing all three will maximise thriving. Reis et al. (2000), Sheldon, Ryan, and Reis (1996), and Sheldon et al. (2001) have all provided empirical support for these assumptions.

The primary purpose of the present research was to test these ideas in a college environment, using students' need satisfaction ratings as the independent variables, and students' teacher-course evaluations as the dependent variables. Hypothesis 1 stated that all three need satisfaction variables would independently predict positive course evaluations. Hypothesis 2 stated that all three need satisfaction variables would independently predict positive teacher evaluations.

Study 1

A survey was administered to 273 students in an undergraduate psychology class at a large midwestern university during the beginning of a winter semester. Five students returned the instrument with missing data and they were excluded, leaving 268 students to be analysed. Students were asked to think back to a recent class that was important to their goals and ambitions. With this in mind, they were asked to rate their agreement with a series of statements regarding that class and its instructor.

Predictor Variables

The survey instrument was based on the Basic Psychological Needs Scale (Ilardi, Leone, Kasser, & Ryan, 1993). While the language of the questions was adapted to fit a classroom setting, the intent of the questions was preserved. Five-point Likert scales were used for each statement. The autonomy items were: "I feel like I had a lot of input in deciding how to learn in this class," "I was free to express my opinions in this class," and "The teacher took my perspective into consideration in this class" ($\alpha = 0.83$). The competence items were: "I enjoyed the challenges this class has provided," "Most days I felt a sense of accomplishment from doing work in this class," and "I do not think the tasks I did in this class were very stimulating" (negative was reversed; $\alpha = 0.81$). The relatedness items were: "The teacher cared about me and my progress," "The teacher was pretty friendly towards me," and "I don't feel the teacher understood me" (negative was reversed; $\alpha = 0.77$).

Outcome Variables

As dependent measures, we asked students to rate the quality of the course and teacher.

TABLE I. Descriptive statistics for need satisfaction and outcome variables in Study 1

Variables	*n*	Mean	SD
Autonomy	268	3.47	1.10
Competence	268	3.61	1.04
Relatedness	268	3.97	0.91
Teacher approval	268	4.03	1.14
Course approval	268	4.00	1.11

Note: Five-point Likert scales were used for all measures

Four items were used: "Overall, this teacher was excellent," "I would recommend this teacher to a friend," "Overall, this was an excellent class," and "I would recommend this class to a friend." These questions are the same as those asked on the official teacher evaluation form at this university that students complete regarding their courses. Composite teacher approval and class approval variables were created by averaging the relevant excellence and recommendation items ($\alpha = 0.92$ and 0.92, respectively).

Although some researchers have argued that such measures simply index teacher popularity, divorced from objective teacher effectiveness (Stumpf & Freedman, 1979), much of the more recent work (d'Apollonia & Abrami, 1997; Greenwald & Gillmore, 1997; Marsh & Roche, 1997; Watkins, 1994) demonstrates that student course evaluations are valid measures of instructional effectiveness. In other words, students know what makes for a good educational experience and what makes for a bad one.

Additional Variables

In addition to indicating their age and gender, students were also asked to recall approximately how many people were enrolled in the course, what grade they received in the course, and what scholastic area the course was in (humanities, natural sciences, or social sciences). We intended to evaluate whether effects varied as a function of student-level variables such as age, grade, or gender, or as a function of class-level variables such as class size and scholastic area. However, we made no predictions concerning these variables.

Results

After running initial data cleaning procedures to check for missing data and outliers, we screened the data a second time for normality, linearity and homoscedasticity. The data fit the requirements for parametric data analysis, and therefore we proceeded to our hypothesis tests. Table I contains descriptive statistics for the primary study variables.

Hypothesis Tests

Hierarchical regression procedures were used to evaluate the simultaneous effects of autonomy, competence, and relatedness need satisfaction upon the two dependent variables of teacher evaluation and course evaluation. The general procedure was that

TABLE II. Coefficients for regressions predicting instructor ratings and course ratings in Study 1

	β	Std error	P
Course ratings			
Student age	0.09	0.020	0.029
Student gender	0.02	0.092	0.709
Grade received	0.08	0.056	0.067
Autonomy	0.17	0.059	0.004
Competence	0.59	0.053	0.0001
Relatedness	0.05	0.073	0.435
Instructor ratings			
Student age	0.08	0.023	0.077
Student gender	−0.08	0.103	0.069
Grade received	0.11	0.061	0.031
Autonomy	0.17	0.066	0.009
Competence	0.44	0.059	0.0001
Relatedness	0.17	0.082	0.011

participant sex, age, and class grade were entered as a block in the first step, to control for any influences of these variables, after which the composite autonomy, competence and relatedness scores were entered in a second block.

Hypothesis 1 stated that autonomy, competence and relatedness would all predict positive course ratings. Neither age nor sex was a significant predictor in the first step, although the grade received in the course was significant ($\beta = 0.32$, $P < 0.0001$). The grades variable became only marginally significant once autonomy, competence, and relatedness were entered ($P < 0.07$) and its impact on the regression was strongly diminished ($\beta = 0.08$). Student age became significant in the second step of the regression ($P < 0.05$) but its β weight was small (0.09).

Of the three SDT variables, competence was the strongest predictor, followed by autonomy (both significant). Relatedness, however, did not prove to be a significant factor for predicting course approval (see Table II for the β weights). Thus Hypothesis 1 did not receive full support.

Hypothesis 2 stated that autonomy, competence and relatedness would predict positive instructor evaluations. We again used a hierarchical regression to assess the validity of this hypothesis. The first step of the regression revealed that sex and age were not significant predictors of instructor ratings, although the grade in the course again demonstrated significant predictive power ($\beta = 0.34$, $P < 0.0001$).

As was the case with the earlier regression, adding autonomy, competence and relatedness to in the second block created a stronger model. Grades remained a significant predictor of instructor ratings ($\beta = 0.11$, $P < 0.05$) but, as above, the β weight had diminished by more than half. Again, competence was the strongest predictor out of the three SDT variables and, indeed, the strongest predictor in the entire model (see Table II). Autonomy and relatedness were also significant and strong predictors, holding the second and third highest β weights, respectively. Based on this analysis, Hypothesis 2 was supported.

Class Characteristics as Predictors

As a supplemental analysis we evaluated two class-level factors as predictors of student

TABLE III. Variations in reported need satisfaction as a function of course topic area

	Need satisfaction		
	Autonomy	Competence	Relatedness
Social sciences ($n = 100$)	3.43	3.66	3.99
Humanities ($n = 40$)	3.83	3.61	4.22
Natural sciences ($n = 24$)	2.97	3.63	3.54
Other ($n = 104$)	3.48	3.57	3.96

Note: The topic-related differences between need satisfaction scores were significant ($P < 0.05$) for autonomy and relatedness, but not for competence.

need satisfaction: class size and academic area. To evaluate the effects of class size, we simply correlated size with each need satisfaction score. This analysis revealed that autonomy and relatedness were substantially negatively correlated with class size ($r = -0.39$ and -0.36, respectively, both $P < 0.01$), whereas competence was much more weakly correlated with class size ($r = -0.18$, $P < 0.01$). To evaluate the effects of topic area, we conducted three ANOVAs predicting each of the three need scores from the course topic, as identified by the student. The topics included social sciences ($n = 100$), humanities ($n = 40$), natural sciences ($n = 24$), and other ($n = 104$). As shown in Table III, participants felt most autonomous and related in humanities courses, and least autonomous and related in natural science courses; social sciences and other courses were in the middle. Interestingly, no differences emerged between topic areas for competence need satisfaction.

In short, participants report greater overall psychological need satisfaction in smaller courses and in humanities courses, feeling least satisfied in large courses and natural science courses. Of course, participants were all psychology students, who self-selected the course they reported upon. Thus, the generalisability of the results remains to be demonstrated.

Study 2

Overall, Study 1 provided good support for our primary hypotheses. However the study was limited in that students were not assessed at the time of, or in the context of, the course itself; instead, participants relied on retrospective memory. Perhaps their memories were inaccurate, or biased by their knowledge of the final grade they received in the course. Furthermore, the topics and level of difficulty of the courses they brought to mind doubtless varied considerably. It would be desirable to test the model holding course and content constant, to reduce error and to better establish effect sizes. It would also be desirable to conduct the study while the course in question is still in progress, so that participants do not yet know their final course grade (as is typically the case when the official teacher-course evaluations are given).

Study 2 provided these opportunities. Specifically, we examined multiple sections of the same course, which was being taught by multiple different instructors during a particular semester. In addition, assessments all occurred within the same fortnight. Thus, course content, semester, and time of semester, were all held constant for the

study. Once again, we hoped to show that autonomy, competence, and relatedness need satisfaction all predict positive course (Hypothesis 1) and teacher (Hypothesis 2) evaluations.

An additional benefit of this multiple sections approach was that we could evaluate instructor characteristics as predictors of student need satisfaction. Do teachers get better, or perhaps worse, at satisfying their students' needs as they gain more overall experience, and experience with a particular course? A good deal of research in this area has turned up mixed results. For example, Feldman (1983) demonstrated that in cross-sectional studies of student evaluations, age and years of teaching experience are negatively related to course evaluations. Longitudinal studies, however, suggest that teachers do not necessarily receive worse evaluations over time (Marsh & Hocevar, 1991). Furthermore, no studies have examined the number of times teachers have taught a particular course as a predictor of student course evaluations. Because of the earlier mixed results and/or lack of results, we did not venture particular hypotheses regarding the instructor variables.

Method

The 179 study participants were sophomore and junior prejournalism students at a large midwestern university, intending to apply for admission to the journalism school upon completion of the course. The class is broken into many sections, with each section taught by a different instructor and comprising 15–20 students. Although the department imposes several requirements upon teachers of this course, the pace and general teaching approach are all up to the individual instructor.

In this particular semester (winter 2001) the course was divided into 16 sections, taught by faculty members, graduate instructors and outside lecturers. The study sample consisted of the students from 12 of these sections (one instructor who taught three sections did not give students the opportunity to participate, and another section was not administered the questionnaire because the instructor is an author of this paper).

Each participating section was visited by a research assistant during a class session near the end of the semester. Students gave no identifying information, and both students and instructors were guaranteed anonymity. We used the same set of questions as before to measure autonomy ($\alpha = 0.73$), competence ($\alpha = 0.86$) and relatedness (alpha = 0.80) as well as the dependent measures of teacher approval ($\alpha = 0.94$) and course approval ($\alpha = 0.87$). In addition, instructor age, sex, overall teaching experience, and teaching experience with this particular prejournalism class were all recorded.

Results

After running initial data cleaning procedures to check for missing data and outliers, the data were screened a second time for normality, linearity and homoscedasticity. The data fit the requirements for parametric data analysis and, therefore, we proceeded. Table IV contains descriptive statistics for the major study variables.

Hypothesis Tests

Again we examined the extent to which each need predicts independent variance in the

TABLE IV. Descriptive statistics for need satisfaction and outcome variables in Study 2

Variables	*n*	Mean	SD
Autonomy	179	5.36	1.17
Competence	179	4.89	1.48
Relatedness	179	5.68	1.10
Teacher approval	179	5.60	1.52
Class approval	179	4.94	1.50

Note: Seven-point Likert scales were used for all measures.

outcomes. As in Study 1 we conducted two simultaneous regressions, one for each outcome measure, in which the particular measure was regressed upon all three need satisfaction scores at once. However, we constructed the models somewhat differently in Study 2, to take account of the multilevel data structure in which participants were nested in particular class sections. Specifically, we used the SAS mixed procedure, and a weighted least squares approach. This enabled us to model and control for any dependencies between participants and the class section they came from. And indeed, an intraclass correlational analysis revealed substantial dependencies. Intraclass correlation coefficients ranged from 0.55 to 0.69 for the five primary study variables; an intraclass correlation of greater than 0.10 for a variable is typically considered justification for employing a multilevel model.

For the course approval outcome (Hypothesis 1), competence emerged with a very large coefficient, whereas autonomy proved to be marginally significant, and relatedness was nonsignificant**.** Thus, these results essentially replicate those of Study 1, in which relatedness did not predict course evaluations, and autonomy was a weaker predictor than competence (see Table V for the relevant standardised coefficients).

However, consistent with Hypothesis 2 and with Study 1, all three need satisfaction variables significantly predicted instructor approval ($P < 0.01$; see Table V). The largest predictor in this regression was competence ($\beta = 0.39$), with autonomy and relatedness close behind (both $\beta = 0.32$).

TABLE V. Coefficients for multilevel models predicting instructor ratings and course ratings in Study 2

	β	Std error	*P*
Course ratings			
Autonomy	0.16	0.090	0.066
Competence	0.68	0.050	<0.0001
Relatedness	0.14	0.090	0.12
Instructor ratings			
Autonomy	0.32	0.10	0.002
Competence	0.39	0.06	<0.0001
Relatedness	0.32	0.10	0.002

TABLE VI. Study 2 correlations between teacher characteristics and average student need satisfaction

	Teacher ($n = 12$) characteristics			
	Gender	Age	Overall teaching experience	Experience teaching this course
Need satisfaction				
Autonomy	0.07	− 0.36	− 0.38	− 0.61*
Competence	0.13	− 0.27	− 0.24	0.01
Relatedness	0.09	− 0.31	− 0.38	− 0.75**

Gender coded 0 = female, 1 = male
* $P < 0.05$
** = $P < 0.01$

Teacher Characteristics as Predictors

Next, we turned to our supplementary analyses. Specifically, we examined the impact of teacher age, gender, overall teaching experience, and experience teaching this particular class, upon student need satisfaction. In other words, we examined this set of level 2 variables as predictors of the substantial intraclass variation in intercepts, that is, class means.

For illustrative purposes, we first we created a sample of 12 instructors, each with an associated class mean representing that instructor's average rated support of student autonomy, competence, and relatedness. Table VI contains the correlations between the instructor demographic variables and the aggregate need satisfaction variables. Although several correlations were substantial, only two were significant, given the small n (in all other cases $P > 0.20$). To be precise, course experience, which measured the number of semesters the instructor had taught this particular class, was negatively significantly correlated with students' average levels of both autonomy and relatedness need satisfaction.

To explore whether these effects truly are specific to the experience of teaching this particular course, we tested models predicting autonomy, competence and relatedness from instructor's specific course experience, while also controlling for instructor gender, age, and overall teaching experience. We used the full sample of 179 for these analyses, including the four instructor-level variables as higher-level predictors within the three multilevel SAS models. This allowed for construction of the most appropriate error terms and significance tests.

In these analyses, effects were essentially unchanged from Table VI: the more the instructor had taught this particular course, the less autonomy and relatedness his/her students felt in the course ($P < 0.05$). None of the other variables reached significance in either the autonomy or the relatedness analysis. Notably, students' sense of competence was unrelated to instructor experience with the course, and was also unaffected by instructor age, gender, and overall teaching experience.

Together, these findings suggest a "course burnout" effect, where those who repeatedly teach a particular class are still effective, but no longer engage their students interpersonally and no longer support students' right to take initiative in the course. Of course, the sample of instructors is small, and such effects remain to be replicated and generalised to other academic disciplines and types of course. It also remains to be seen

whether this need deprivation effect has significance for students' learning and mastery of the class material, as we would expect.

Discussion

This work builds significantly on previous self-determination theory research in the education domain (Deci, Nezlek, & Sheinman, 1981; Grolnick & Ryan, 1987; Miserandino, 1996), by focusing on college-level education, by focusing simultaneously on all three of the needs proposed by the theory, and by focusing on an important outcome, namely, formal teacher-course evaluations.

Primary Findings

The primary finding was that all three needs positively predicted instructor and/or course ratings. Thus the results were consistent with our hypotheses, and with SDT's contention that it is important for authorities to try to provide all three of these qualities of experience for their charges.

The results also showed some differences, as a function of whether course or instructor ratings were being predicted. Specifically, in both studies, students' feelings of competence and autonomy were significant predictors of both teacher and course evaluations, whereas relatedness need satisfaction predicted only teacher evaluations. We believe this difference is understandable, given the salient learning and grade goals associated with college classes. In other words, when students evaluate whether they learned and performed well in a class, the issue of relatedness with the instructor may not come to mind, or be subsumed by other considerations. Notably, relatedness was significantly positively correlated with class ratings in both studies at the zero-order level ($P < 0.01$), only failing to account for independent variance in the simultaneous analysis. This pattern suggests that competence and autonomy effects may to some extent mediate instructor relatedness effects upon course evaluations (Baron & Kenny, 1986).

Higher-Level Analyses

Additionally, the current studies evaluated several class-level factors that might impact student teacher-course evaluations. Study 1 evaluated the impact of class size and class topic area upon need satisfaction, finding that students felt more autonomy, competence and relatedness in smaller classes, felt the most autonomy and relatedness in humanities classes, and felt the least autonomy and relatedness in natural science classes. The size pattern seems expectable, given the difficulty of carefully attending to each student's needs within large classes. The topic area pattern may also be expectable, given the differing questions and approaches – the subjective interpretation/personological focus of humanities versus the objective information/technical skill focus of science courses (Sheldon, 1994). Interestingly, competence need satisfaction did not vary between class topic areas, indicating that teachers are equally effective in each domain.

Study 2 also focused on class-level factors – specifically, instructor characteristics. We found evidence for a "course burnout" effect, in which instructors who teach courses too many times may begin to ignore their students' autonomy and relatedness needs.

This effect was clearly not a function of instructor age, gender, or overall teaching experience, as these three variables were partialled out of the analyses.

Of course, interpretations must be tentative until further data are obtained. However one possibility is that instructors' own psychological needs are not met when they repeatedly teach the same course, and as a result they lose their ability or desire to reach out to students, although their ability to support student competence is undiminished. An implication is that instructors should consider mixing up their teaching schedule, rather than teaching the same course again and again. An analogy could be drawn to crop rotation, in which repeatedly planting the same crop year after year saps the soil of key nutrients. Similarly, repeatedly teaching the same course year after year may sap teachers of key psychological resources. In contrast, by teaching different courses and thereby reviving their own intrinsic motivations, teachers may enhance their ability to support the needs of their students. Again, however, these results are only preliminary, and remain to be replicated.

The Advantages of Applying SDT

An advantage of the SDT approach taken in this article is that it may help to clarify and organise prior educational research regarding what makes for a good educational experience. As mentioned in the introduction, teacher characteristics such as fairness, choice-provision, openness and encouragement (Feldman, 1976), and class characteristics such as group interaction and cooperative teaming (Marsh, 1987) have been found to be positively correlated with students' ratings of good teaching. In SDT terms, these characteristics may support students' autonomy and relatedness needs, respectively. Other factors found previously to influence student evaluations include the level of learning value of the course, instructor knowledge regarding the course, course clarity, and course coverage; in SDT terms, these characteristics may support students' competence needs. In short, SDT's concept of psychological needs may provide a parsimonious way of categorising research findings in this area.

Why is need satisfaction so important? According to SDT, supporting students' needs helps supply the "spark" to engage students' intrinsic motivations. This is a highly desirable outcome, given the fact that intrinsically-motivated behaviour is more flexible, persistent, creative, and effective, in addition to being more enjoyable (see Deci, Koestner, & Ryan, 1999, for a review). We believe that most students, regardless of how much they might obsess over their grade-point average, want to learn from, and enjoy, their classes. The current study suggests that by allowing students to learn in their own way (autonomy), by providing them with the tools to succeed (competence), and by defusing or removing authoritarian barriers (relatedness), instructors can give their students an interesting, challenging, and intrinsically motivating educational experience. Notably, however, we did not measure students' intrinsic motivation directly in this study; this remains for future research.

Several other caveats are in order regarding the study. First, results are all correlational and thus the causal interpretations above need bolstering. Experimental research, for example concerning the effects of different amounts and combinations of teacher need support upon student outcomes, is clearly needed (and is in progress within our lab). Second, we make no claim to have measured student learning. Thus, for now, we can only assume that need satisfaction was also correlated with student learning and achievement, by way of students' intrinsic motivation (Elliot & Church, 1997). Third, other sources of data are missing, beyond student self-report. For example, it would be

valuable to collect objective observer ratings of teacher need support, to validate and perhaps complement students' ratings of teacher support (Grolnick & Ryan, 1987).

Despite these limitations, we believe this study offers important new support for self-determination theory postulates, as well as suggesting three very important factors for teachers to keep in mind as they interact with their students.

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