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The Relationship between Professors' Motivation and Interpersonal Behaviour Styles in the Classroom, and Course Evaluations

Meredith Rocchi
University of Ottawa, meredith.rocchi@uottawa.ca
Jenepher Lennox-Terrion
University of Ottawa, jenepher.lennox-terrion@uottawa.ca

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Abstract

Professors create a positive learning environment for students through their interpersonal behaviour style in the classroom. High quality interpersonal interactions are associated with a number of positive student outcomes such as increased motivation, effort, learning, satisfaction, and higher ratings on formal student evaluations of teaching (SETs). This study tested a Self-Determination Theory model in a university setting by measuring the association between professors' reported psychological need satisfaction, teaching motivation, and self-reported supportive interpersonal behaviour styles, exploring how these variables related to SETs. Overall, we found support for the model; all relationships were significant and in the expected direction except that reported autonomy and competence supportive behaviours did not relate to SETs. From this, we can conclude that relatedness support is important to the student experience and that professors who engage in relatedness supportive interpersonal behaviours are also positively evaluated by their students.

Les professeurs et les professeures créent un environnement d'apprentissage positif pour les étudiants et les étudiantes grâce à leur style de comportement interpersonnel dans la salle de classe. Les interactions interpersonnelles de haute qualité sont associées à un certain nombre de résultats positifs parmi les étudiants et les étudiantes tels que l'augmentation de la motivation, des efforts, de l'apprentissage, de la satisfaction, ainsi que des scores plus élevés dans les évaluations de l'enseignement formelles par les étudiants. Cette étude a examiné un modèle de théorie d'auto-détermination dans un milieu universitaire en mesurant l'association entre les besoins psychologiques tels que rapportés par les professeurs et les professeures en matière de satisfaction et de motivation à enseigner, et les styles de comportement interpersonnel de soutien auto-rapportés, et elle explore comment ces variables sont liées aux évaluations de l'enseignement par les étudiants et les étudiantes. Dans l'ensemble, nous avons trouvé qu'il existait un soutien pour le modèle et que toutes les relations étaient significatives et allaient dans la direction attendue, sauf que l'autonomie et les comportements de soutien de la compétence rapportés n'étaient pas liés aux évaluations de l'enseignement par les étudiants et les étudiantes. Ceci nous permet de conclure que le soutien de la relation est important pour l'expérience des étudiants et des étudiantes et que les professeurs et les professeures qui s'engagent dans des comportements interpersonnels relationnels de soutien sont également évalués de manière positive par leurs étudiants et leurs étudiantes.

University professors' interpersonal communication behaviors in the classroom have been shown to have an impact on students' learning and psychological outcomes, and thus on their perceptions of their university experience (e.g., Frisby et al., 2014; Messman & Jones-Corley, 2001; Rogers, 2015; Vallade et al., 2020). Why do some professors engage in interpersonal communication behaviors that are positively perceived by students such as being respectful, knowledgeable, engaging, and responsive (i.e., Delaney et al., 2010; Lee et al.,2015), while others do not? What leads professors to engage in these types of communication behaviors and how do they translate into measures of teaching effectiveness, including formal student evaluations of teaching (SET)?

Self-Determination Theory

One theory that provides a framework for exploring the antecedents and role of university professors' interpersonal communication behaviors in the classroom is Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2017). SDT postulates that there are three types of interpersonal behaviors: autonomy-support (providing choice and giving opportunities for students to take initiative), competence support (giving positive feedback and showing students they can achieve), and relatedness support (creating a warm environment and showing concern and care for others). When professors engage in these behaviors in the classroom, positive outcomes result for students in areas such as learning (Black & Deci, 2000), engagement (Reeve et al., 2004), initiative (Danielsen et al., 2010), and decision-making (Stefanou et al., 2004). Although SDT posits that all three types of interpersonal behavior are essential (Ryan & Deci, 2017; Sheldon & Filak, 2008), most research has focused mainly on the role of autonomy support in the classroom (e.g., Patall et al., 2018; Reeve & Jang, 2006; Reeve et al., 2004).

In addition to postulating about interpersonal behaviors, SDT also examines basic psychological needs and how they are met. According to SDT, humans have fundamental needs for autonomy (the need for individuals to act in line with their own interests and values), competence (the need for opportunities for increasing levels of challenge at an activity and developing greater levels of mastery) and relatedness (the need for a caring, supportive social network with strong interpersonal connections) (Deci & Ryan, 1985; Ryan & Deci, 2017). When professors' psychological needs of autonomy, competence, and relatedness are satisfied through their teaching, they experience increased autonomous motivation towards teaching (where they teach because they want to) and decreased controlled motivation (where they teach because they have to) (e.g., Ahn et al., 2021; Haerens et al., 2015). Autonomous motivation towards teaching is considered optimal since it is said to promote a number of positive outcomes for professors including increased reported use of autonomy, competence, and relatedness supportive behaviours in the classroom (e.g., Ahn et al., 2021; Deci & Ryan, 2000; Pelletier et al., 2002, Pelletier & Rocchi, 2016; Sheldon & Filak, 2008), as well as commitment, creativity, and engagement (Collie et al., 2016; Roth, 2014). Controlled motivation, however, is not ideal since it promotes decreased reported use of autonomy, competence, and relatedness supportive interpersonal behaviour (e.g., Reeve, 2009), as well as increased burnout and dissatisfaction (e.g., Richardson et al., 2014; Van den Berghe et al., 2014).

Teaching Quality

Although there is growing evidence that autonomy, competence, and relatedness supportive interpersonal behaviours promote positive outcomes for students (i.e., engagement; Hospel & Galand, 2016), there is less evidence demonstrating how reports of these behaviours relate to formal indicators of teaching quality and effectiveness. Currently, the most widely used (and often only) indicator of teaching quality are SETs (Cunningham-Nelson et al., 2019). SETs are completed by students every semester and serve as the industry standard for assessing instructors and establishing tenure and promotions (Cashin, 1999; Kelly, 2012). From an SDT perspective, a few studies examining students' perceptions of autonomy support, psychological need satisfaction, motivation, and SETs have found that students' perceptions of their professors' autonomy supportive behaviors are associated with increased student needs satisfaction, autonomous motivation, and higher ratings on SETs (Filak & Sheldon, 2008; Sheldon et al., 2009). These studies provide evidence for the relationship between students' perceptions of professors' need supportive interpersonal behaviors and their role in promoting positive SETs. To date, however, no studies have examined professors' experiences, their reported use of all three types of need supportive interpersonal behaviors in the university classroom, and how their reported behaviors are linked to SETs.

Present Study

This study aimed to test an SDT model in a university context by exploring the relationship between professors' psychological need satisfaction while teaching, their motivation towards teaching, their interpersonal behavior styles in the classroom, and their SETs. Specifically, the study asked professors to report on their autonomy, competence, and relatedness satisfaction, their autonomous and controlled motivation for teaching, and their use of autonomy, competence, and relatedness supportive behaviours in their largest university class. These constructs were then used to a test a model predicting the SETs for their largest university course. It should be noted that although SETs have been criticized for not being a reliable or valid measure of course quality (i.e., Spooren et al., 2013), particularly because they discriminate based on characteristics of the professor such as gender or race (Heffernan, 2021), they were used as the primary outcome of this study since researchers support that SETs do provide insight into the effectiveness and quality of the professor (e.g., Marsh, 2007). Furthermore, there are no other universally accepted approaches for evaluating teaching quality (i.e., Kulik, 2001) and SETs are often used as the only indicator of teaching quality in almost all university settings (i.e., Cunningham-Nelson et al., 2019).

As per SDT, we hypothesized that professors' psychological need satisfaction (autonomy, competence, and relatedness) would be associated with increased reported autonomous motivation and decreased controlled motivation towards teaching. We also hypothesized that professors' autonomous motivation would be associated with increased reports of supportive behaviours (autonomy, competence, and relatedness) and controlled motivation would be associated with decreased reported supportive behaviours. Finally, we hypothesized that professors' interpersonal behaviours would be positively associated with their SETs for the course they reported on.

Method

Participants

The sample was composed of 211 professors (male = 108, female = 103) at a large Canadian university. Their average age was 50.94 (SD = 10.47) and the majority had a Ph.D. (n = 179, 86%), while the remaining professors had either a M.A. or L.L.M degree (n = 30, 14%). They had between 1 and 82 semesters of teaching experience, with an average of 25.11 (SD = 18.95) semesters.

Procedure

Before beginning data collection, the study was approved by our institution's research and ethics committee. A random selection of 800 professors who taught courses during the Winter and Fall 2015 semesters was contacted through the university's internal list-serve at the start of the Winter 2016 semester (response rate = 26%). Potential participants each received an email invitation to participate in a study about their pedagogical approaches which enhance the experiences of students and professors at the University. They were also informed that the data collected through the questionnaire would be cross-referenced with their formal teaching evaluations. Interested participants provided their informed consent and then were given access to the online survey.

Materials

Participants provided their general demographic information, as well as an overview of their educational and teaching experience. They were also asked to provide a list of all of the courses they had taught during the 2014-2015 academic year. If they reported teaching more than one course that year, and to reduce bias towards smaller classes where participants would be more likely to know their students personally, they were asked to identify their largest course and then respond to the following measures about their experiences teaching in that specific context.

Course Information

For their largest or only course, professors reported the course code, the number of students enrolled, the number of times they had taught this course previously, whether it was a required course (yes/no), which semester it had fallen in (Fall 2014/Winter 2015), and the time of day it was offered.

Need Satisfaction

Professors completed the positive items from the *Basic Need Satisfaction at Work Scale* (Deci et al., 2001) to assess the extent to which their needs for autonomy (e.g., "I have a sense of choice and freedom in the things I undertake"), competence (e.g., "I am capable at what I do"), and relatedness (e.g., "I feel close and connected with other people who are important to me") were satisfied while teaching. They responded to each item using a 7-point scale, ranging from 1 ("do not agree at all") to 7 ("completely agree") and the internal consistencies were evaluated for

each subscale (autonomy α = .66; competence α = .59; relatedness α = .72). A mean score was calculated for each subscale and used for the subsequent analyses.

Motivation for Teaching

Professors completed the *Motivation at Work Scale* (MAWS; Gagne et al., 2010) to assess their autonomous and controlled motivation towards teaching. Specifically, the MAWS is a 12-item scale assessing professors' intrinsic (3 items, e.g., "Because I enjoy this work very much"), identified (3 items, e.g., "Because this job fulfills my career plans"), introjected (3 items, e.g., "Because my work is my life and I don't want to fail"), and external (3 items, e.g., "Because this job affords me a certain standard of living") motivation. They responded to each item using a 7-point scale, ranging from 1 ("do not agree at all") to 7 ("completely agree") and the internal consistency for the four subscales was strong (α = .92, .82, .82, and .78). A mean score was calculated between the intrinsic and identified items to represent professors' autonomous motivation for teaching, while a mean score was calculated between the introjected and external items to represent controlled motivation.

Interpersonal Behaviors

The professors completed selected items from the *Interpersonal Behaviors Questionnaire – Self* (IBQ-Self; Rocchi et al., 2017) to assess the extent to which they believed they engaged in specific types of interpersonal behaviours when teaching. The professors responded to two items from the supportive subscales assessing their reported autonomy supportive (e.g., "give them freedom to make their own choices"), competence supportive (e.g., "provide valuable feedback"), and relatedness-supportive (e.g., "honestly enjoy spending time with them") behaviours. They responded to each item using a 7-point scale, ranging from 1 ("do not agree at all") to 7 ("completely agree') indicating the extent to which each statement applied to their own interactions while teaching using the stem "When I teach course _____, I ___". The internal consistencies were calculated for each subscale using both items and supported that it was strong (α = .77, .80, and .81). A mean score was calculated for each of the three types of behaviours and used in the subsequent analyses.

Formal Course Evaluations

Each professor's official course SET report for the course in question was examined in order to obtain an objective, student-based assessment of their quality of teaching. These reports are standardized forms completed by students during the 10th and 11th weeks of their semester. For this study, we focused on the questions that were specific to the professor and not the content of the course or other factors. We used the following three questions to represent professors' teaching quality: (1) *"I think the professor conveys the subject matter effectively"*, (2) *"I find the professor well-prepared for class"*, and (3) *"I find that the professor as a teacher is..."*. The first two questions were assessed on a 5-point scale from 1 ("almost never") to 5 ("almost always"), and the third one used a 5-point scale from 1 ("very poor") to 5 ("excellent"). For all three items, higher scores represented higher teaching quality. Additionally, we extracted information about the percentage of students enrolled in the class who attended the course on the day the course evaluation was conducted.

Analyses

First, descriptive statistics were calculated for the largest (or only) course reported by each professor. Next, professors' demographic characteristics and course information was correlated with the three formal course indicators in order to identify any potential covariates. Finally, a path model examining the relationship between professors' reported need satisfaction and frustration, their autonomous and controlled motivation for teaching, their reported supportive interpersonal behaviours, and the three SET indicators was tested using Mplus Version 6 (Muthén & Muthén, 2007).

Results

The descriptive statistics were calculated for the characteristics of the course reported for each professor. Please see Table 1 for an overview of which courses the professors were teaching, the number of students in the course, the number of times they had taught the course, the attendance percentage, whether it was a required course, and the faculty the course was in.

Table 1
Descriptive Statistics for Course Information

Variable	Frequency	%	Mean	SD	Range
Faculty					
Arts	65	31	-	-	-
Education	15	7	-	-	-
Engineering	23	11	-	-	-
Health Sciences	19	9	-	-	-
Law	11	5	-	-	-
Management	21	10	-	-	-
Sciences	36	17	-	-	-
Social Sciences	21	10	-	-	-
Average enrollment	-	-	98.97	50.10	3 – 540
Times taught course	-	-	8.31	7.87	0 – 69
Attendance percentage	-	-	79.11	18.28	8 – 100
Required course					
Yes	131	70	-	-	-
No	57	30	-	-	-
Semester					
Winter 2015	130	62	-	-	-
Fall 2015	81	38	-	-	-
SETs					
Prepared for Class	-	-	4.61	0.40	2.16 – 5
Conveys Subject	-	-	4.16	0.58	1.33 – 5
Overall Quality	-	-	4.17	0.59	1.72 – 5

Note. $n = 211$. All variables were reported by the professors except for the SET values which were collected from the official course evaluation reports for each professor.

Next, the course characteristics were correlated with the three course evaluation indicators in order to identify potential covariates (see Table 2) and independent ANOVA analyses were performed to confirm there were no differences by faculty (Prepared: $F(7,152) = 1.68$, $p = .118$; Conveys subject ($F(7,152) = 1.83$, $p = .09$; and Overall Quality: $F(7,152) = 1.02$, $p = .416$). This analysis identified attendance percentage as a significant covariate of overall quality; as such it will be added to the final path model.

Table 2

Correlations Between Course and Professor Characteristics and SETs

Variable	Enrollment	Times Taught	Attendance	Required	Semester
Prepared	.08	-.06	.05	.01	-.13
Conveys Subject	.00	-.03	.11	.08	-.11
Overall Quality	-.05	-.05	.28*	.03	.10

Note. $n = 211$. * $p < .05$.

Next, descriptive statistics were calculated for the 12 model variables (3 variables = need satisfaction, 2 variables = motivation, 3 variables = interpersonal behaviours, 3 variables = SETs, 1 covariate = attendance), and were cleaned and screened for univariate and multivariate outliers (see Table 3). The results did suggest that that some of the variables were skewed (i.e., autonomy satisfaction, competence satisfaction, competence support), which is not uncommon in the social sciences (Barnes et al., 2001).

Table 3

Descriptive Statistics for Model Variables

Variable	Mean	SD	Range
Autonomy Satisfaction	5.80	1.20	1 – 7
Competence Satisfaction	6.00	0.98	1 – 7
Relatedness Satisfaction	4.36	1.17	1 – 7
Autonomous Motivation	5.58	1.17	1.83 – 7
Controlled Motivation	1.73	1.25	1 – 7
Autonomy Support	5.53	1.18	1 – 7
Competence Support	6.20	0.93	1.46 – 7
Relatedness Support	5.31	1.35	1 – 7
Prepared for Class	4.61	0.40	2.16 – 5
Conveys Subject	4.16	0.58	1.33 – 5
Overall Quality	4.17	0.59	1.72 – 5

Note. $n = 211$.

Since the model was estimated using bootstrapping with bias corrected confidence intervals, which are robust to non-normality (Muthén & Muthén, 2014), no transformations were performed on the model variables. Univariate outliers were recoded to the closest in-range value and no multivariate outliers were identified. As a final preliminary analysis, correlation analyses were performed between all 12 model variables before proceeding with the full model testing (see Table 4).

Table 4

*Correlations Between Model Variables*

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Autonomy Satisfaction	-	.50*	.46*	.45*	-.24*	.23*	.17*	.17*	.04	.03	.05	.08
2. Competence Satisfaction		-	.42*	.51*	-.16*	.24*	.16*	.19*	-.04	.03	.10	.03
3. Relatedness Satisfaction			-	.48*	-.35*	.15	.11	.35*	.01	.10	.03	.04
4. Autonomous Motivation				-	-.42*	.23*	.28*	.45*	.07	-.03	.10	.05
5. Controlled Motivation					-	.21*	.11	-.24*	.00	.03	.05	-.04
6. Autonomy Support						-	.30*	.31*	.00	.08	.05	.04
7. Competence Support							-	.23*	.01	.03	.03	.11*
8. Relatedness Support								-	.23*	.23*	.26*	.12
9. Prepared for Class									-	.84*	.79*	.05
10. Conveys Subject										-	.96*	.11
11. Overall Quality											-	.28*
12. Attendance Percentage												-

Note. $n = 211$. * $p < .05$.

Next, to test the proposed model, a path analysis was conducted and results were reported using 1000 bootstrap 95% bias-corrected confidence intervals (bCI) as the indicator of significance. bCIs are confidence intervals that correct for the bias between the bootstrap condition and the sample. Significance is determined when the 95% bCI does not cross 0, equivalent to p<.05. Bootstrapping was used as it reduces type 1 error and 95% bCIs are more accurate than non-bootstrapped estimated confidence intervals (Preacher & Hayes, 2008). Please see Figure 1 for the path analysis results.

Figure 1

Final Model Examining Need Satisfaction, Motivation, Supportive Interpersonal Behaviours, and SETs
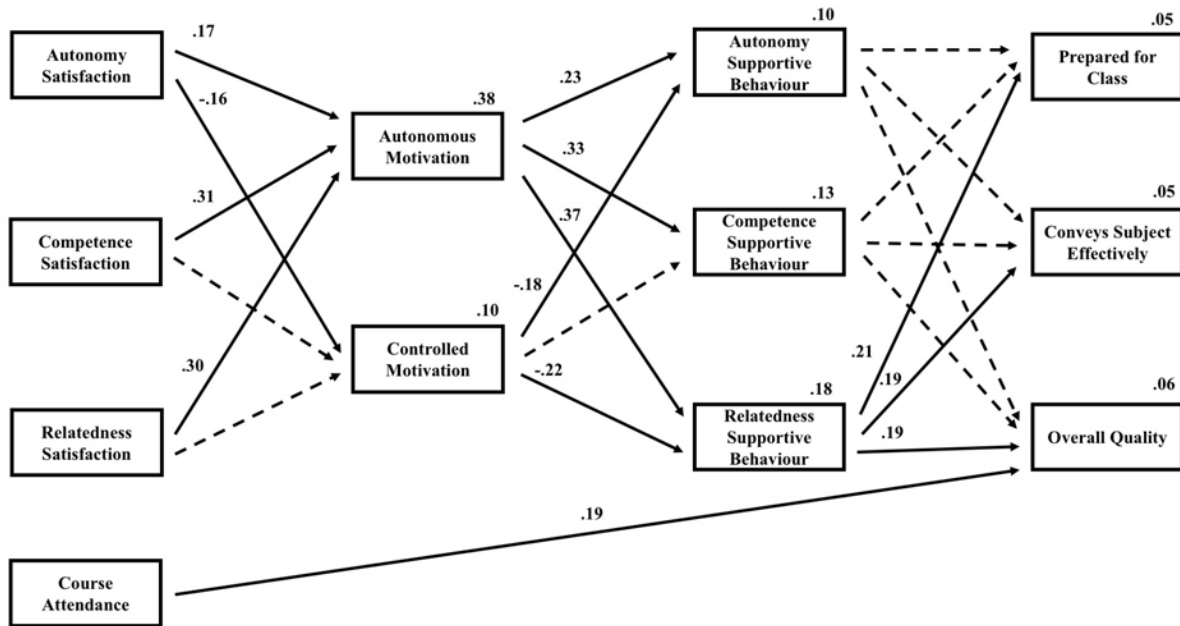
Note. Solid line = statistical significance. Dotted lines = non-significant. Values in superscript = variance explained (r^2). Only significant values are presented, for all regression coefficients and bias corrected confidence intervals, see Table 5.

Table 5 highlights the unstandardized regression coefficients, the 95% bCIs, and the standardized regression coefficients for all model relationships.

Table 5

Path Model Regression Coefficients

Relationship	B	95% bCI	β
Needs on Motivation			
Autonomy Satisfaction → Autonomous Motivation	0.16*	0.02 – 0.28	.17
Competence Satisfaction → Autonomous Motivation	0.36*	0.18 – 0.57	.31
Relatedness Satisfaction → Autonomous Motivation	0.19*	0.10 – 0.28	.30
Autonomy Satisfaction → Controlled Motivation	-0.17*	-0.38 – -0.01	-.16
Competence Satisfaction → Controlled Motivation	0.03	-0.15 – 0.21	.03
Relatedness Satisfaction → Controlled Motivation	0.10	-0.05 – 0.25	.08
Motivation on Interpersonal Behaviours			
Autonomous Motivation → Autonomy Support	0.24*	0.08 – 0.41	.23
Autonomous Motivation → Competence Support	0.23*	0.12 – 0.35	.33
Autonomous Motivation → Relatedness Support	0.43*	0.27 – 0.57	.37
Controlled Motivation → Autonomy Support	-0.16*	-0.35 – -0.16	-.18
Controlled Motivation → Competence Support	-0.08	-0.19 – 0.02	-.13
Controlled Motivation → Relatedness Support	-0.24*	-0.45 – -0.02	-.22
Interpersonal Behaviours on SETs			
Autonomy Support → Prepared for Class	-0.03	-0.09 – 0.03	-.08
Competence Support → Prepared for Class	-0.21	-0.08 – 0.11	.04
Relatedness Support → Prepared for Class	0.06*	0.00 – 0.11	.21
Autonomy Support → Conveys Subject	0.01	-0.14 – 0.10	-.01
Competence Support → Conveys Subject	0.03	-0.12 – 0.18	.03
Relatedness Support → Conveys Subject	0.09*	0.00 – 0.17	.19
Autonomy Support → Overall Quality	0.01	-0.12 – 0.08	.00
Competence Support → Overall Quality	0.02	-0.13 – 0.14	.04
Relatedness Support → Overall Quality	0.10*	0.01 – 0.20	.19
Covariates			
Attendance Percentage → Overall Quality	0.03*	0.01 – 0.06	.09

Note. n = 211. * = Statistical significance (99%). B = unstandardized regression coefficient. 95% bCI = 95% bias corrected confidence intervals. β= standardized regression coefficient.

As per SDT, autonomy satisfaction was positively associated with autonomous motivation and negatively associated with controlled motivation. Competence and relatedness satisfaction were positively associated with autonomous motivation and had no relationship with controlled motivation. As hypothesized, autonomous motivation was positively associated with professors' reported use of autonomy, competence, and relatedness supportive behaviours; whereas controlled motivation was negatively associated with autonomy supportive and relatedness supportive behaviours. Finally, only reported relatedness satisfaction was associated with SETs, after controlling for course attendance (for overall quality) and accounted for approximately 5% of the variance in SETs.

Discussion

The purpose of this study was to explore the relationship between professors' psychological needs in the classroom, their motivation for teaching, their interpersonal behavior styles in the

classroom, and their formal course evaluations (SETs). Specifically, it moved beyond a common focus on student motivation and the experience of students in the classroom to study the experience of professors. This study was the first to examine professors' self-reported autonomy, competence, and relatedness supportive behaviours and how these related to the professors' SETs and the results provide support for an SDT model in this setting.

Our first hypothesis, which predicted that professors' need satisfaction (autonomy, competence, and relatedness) would be associated with reports of increased autonomous motivation and decreased controlled motivation for teaching, was supported. This relationship has been demonstrated in a significant volume of work within the SDT literature examining teachers in high school, elementary school, and physical education settings (e.g. Van den Berghe, et al., 2014). Our results support that this relationship also holds in the university setting.

We found support for our second hypothesis, which asserted that professors' autonomous motivation significantly predicted their reported autonomy, competence, and relatedness behaviours, with the strongest relationship found with relatedness supportive behaviours. Controlled motivation, however, was only significantly related negatively to autonomy and relatedness supportive behaviours. These results are novel since no other studies, to our knowledge, have looked at the relationship between motivation towards teaching and reported use of all three types of interpersonal behaviours in a university setting. Our findings supported the importance of examining professors' reported competence and relatedness supportive behaviours, in addition to their autonomy supportive behaviours (Niemiec & Ryan, 2009; Sheldon & Filak, 2008).

For our second hypothesis, it is not surprising that the data yielded a significant positive relationship between professors' reported autonomous motivation and their autonomy supportive behaviours in the classroom and a negative relationship with controlled motivation, as these links have already been demonstrated in other studies (e.g., Pelletier et al., 2002; Reeve, 2009). Interestingly, autonomous motivation did not have the strongest relationship with autonomy supportive behaviours. This may be explained by considering that the context of university teaching and learning is inherently controlling. In the university setting, many variables -- including the size of the classroom, the course itself, the content of the course material, the curricular expectations of the university, the possibility of standardized curriculum [and evaluations of student learning] -- may impact professors' autonomous and controlled motivation, thus discouraging them from engaging in autonomy-supportive behaviours (Reagan, 1982). That is, a professor might value autonomous behaviour but be limited in his or her freedom and opportunities to engage in it in the context of university classrooms. While we did find that professors who have an autonomous motivation towards teaching are more likely to report engaging in autonomy supportive behaviours, it is possible that developments in higher education have led to greater constraints on academic freedom and that these might limit the actual autonomy supportive behaviours of our sample. These constraints, while not measured in our study, are likely part of the reality of today's university classrooms and thus potentially influence our sample of professors. If, on the other hand, they had unlimited freedom to teach as they see fit (in terms of course design, delivery, and evaluation of learning) it is likely that they would do things differently and the relationship between autonomous motivation and autonomy supportive behaviours might be stronger.

In terms of the relationship between professors' autonomous motivation and their reported competence supportive behaviours, it is not surprising that these are linked. Given the role of the professor to teach students, enabling them to learn material and demonstrate their learning, it may

be plausible that competence supportive behaviour (i.e., providing feedback, encouraging students to learn the material, acknowledging their abilities to learn the material) are among the most basic teaching tasks; therefore, irrespective of their motivation for teaching (i.e. why they teach), they may engage in these behaviours as a routine part of their job.

As for the link with relatedness supportive behaviours, it is possible that this may have the strongest relationship because, in the university setting, engaging in relatedness supportive behaviours (i.e., being interested in what students do, getting to know them, honestly enjoying spending time with them, and relating to them) requires going above and beyond teaching duties in the classroom. These behaviours are not rewarded directly, evaluated by departments, or captured in SETs. As such, it is plausible that this is where autonomous motivation really plays a role in the university setting: it may reflect the behaviours of professors who are willing to go above and beyond the expectations of their job. While our study demonstrated that professors who are more autonomously motivated (they love teaching, they value it, they think it's important, etc.) are more likely to engage in these extra relatedness-supportive behaviours, it is plausible that these same professors benefit from engaging in these behaviours by enjoying a more satisfying and enjoyable classroom experience themselves. In sum, engaging in relatedness supportive behaviours may foster a positive relationship and experience for both students *and* professors, and this in turn may contribute to the professor's own need satisfaction in a positive feedback loop. This process has been found in other domains including friendships (Deci et al., 2006) where individuals benefit from both giving and receiving need support.

Our third hypothesis suggested that professors' interpersonal behaviours will be positively associated with their formal course evaluations. Unexpectedly, autonomy and competence supportive behaviours were not associated with course evaluations. Similar to what was discussed above, it is possible that the content of the course limits a professor's ability to engage in autonomy-supportive behaviours but that, in any case, students do not expect professors to engage in these behaviours or are not impacted by a lack of their performance in the classroom. In sum, perhaps students do not expect more of their learning experience and thus they do not take into account autonomy supportive behaviours in evaluating their professors. Some research suggests, in fact, that many university students do not perceive themselves as autonomous learners (Henri et al., 2018). This may be particularly true for students in first year at university, where the learning style is a continuation of the more controlled model of secondary school (Lowe & Cook, 2003), or for those students who engage in a "dependent, surface approach to their higher education" (Henri et al., p. 508) rather than a deep and independent approach "which reflects ownership of learning and self- management (Henri et al., p. 508).

Similarly, attempts to engage in competence-supportive behaviours may also get lost and are not perceived by students since it is expected that professors will engage in ways that help students learn and master the course material. For example, Wilson and colleagues (Wilson et al., 2004) identified behaviours that professors should be engaging in. These included: providing clear syllabi, calendars, and communication tools; modeling various strategies for effective participation and learning; monitoring students' progress and providing them with feedback; and troubleshooting as required. Given that these behaviours, which could be described as competence-supportive, are considered to be baseline of what students expect from their professors, it possible that students do not link these to teaching excellence on SET questions. This is especially relevant as more students come to expect a learner-centered environment with lots of support as the norm (Bishop et al., 2014).

Finally, it is not surprising that a positive link between relatedness supportive behaviours and SETs was found. First, a significant body of research has demonstrated that most of the emotional content of messages is communicated through non-verbal communication (i.e., immediacy, smiling, etc.; Mehrabian, 1971) and that positive affect is conveyed mainly through gestures, facial expression, and body movement (Ekman, 2004). As such, professors who go out of their way to engage with students and create a positive environment are more likely to be perceived positively by students. Furthermore, professors who are approachable and say "hi" on campus, know their students' names, and go out of their way to be available to meet with students, are rated positively by students compared to professors who do not engage in those behaviours (Denzine & Pulos, 2000). Finally, students who perceive that they have a close relationship with their professor are more likely to report that they believe the professor is honest, caring, safe, encouraging, and supportive, and report them as a higher quality teacher (Fitzmaurice, 2008). Given that previous research has found that that these behaviours are related to positive evaluations of teaching (Gurung & Vespia, 2007), it appears that professors should engage in relatedness-supportive behaviours in the classroom.

Limitations

Although this study was the first to find a relationship between professors' reported use of interpersonal behaviours and their students' formal SETs, there are some important limitations. The first limitation is that we asked professors to report on their own interpersonal behaviours, without cross-referencing these reports with students' impressions of their professors' behaviour. Another limitation is that we relied on SETs as an indicator of teaching quality, even though they have been criticized for their effectiveness and reliability (i.e., Spooren et al., 2013). Once a universally accepted approach for evaluating university teaching quality is developed (i.e., Kulik, 2001), this research should be replicated using that indicator. Finally, in this study we did not control for the curriculum of the class, the size of the class, or any other potential classroom barriers that may limit a professor's ability to engage in supportive interpersonal behaviours in their classroom.

Future Research

Moving forward, future research needs to further examine the role of relatedness support in the classroom. Specifically, researchers should aim to observe these behaviours in the classroom first-hand in order to determine what these behaviours look like, what they sound like, and what professors who engage in relatedness supportive behaviours actually do. Additionally, researchers should look at implementing relatedness supportive interpersonal behaviour training for professors. Similar to the work that has been done by Reeve and colleagues (e.g., Reeve, 1998; Su & Reeve, 2011), training programs should be developed in order to encourage professors to engage in more relatedness supportive behaviour.

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