
TEACHER–STUDENT RAPPORT AS PREDICTOR OF LEARNING MOTIVATION WITHIN HIGHER EDUCATION: THE SELF–DETERMINATION THEORY PERSPECTIVE

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Abstract

Teacher-student rapport is a relatively new concept and represents one of the aspects of the classroom environment fostering learning. It contributes to the classroom climate and well-being of students. Our study aimed to investigate the predictive value of teacher-student rapport in higher education on students' autonomous motivation for learning as defined in self-determination theory. The study included 1,682 students attending classes of 50 teachers from three Slovene public universities. Self-reported measurements of teacher-student rapport (Instructor-Student Rapport Scale; Bardorfer & Kavčič, 2020), teachers' effectiveness (Student Evaluation of Educational Quality Scale; Marsh, 1982), and autonomously regulated behavior of students (The Self-Regulation Questionnaire-Academic; Ryan & Connell, 1989) expressed with the index of relative autonomy (RAI) were used in the study. The results of hierarchical linear modelling showed that teacher-student rapport significantly predicted students' intrinsic motivation to learn the subject matter. We conclude that establishing rapport between teachers and their students represents an effective way of encouraging students' intrinsic motivation for learning the subject matter. The paper closes with some of the implications of the study on how teachers can try to establish rapport with students.

Keywords: teacher-student rapport; interpersonal relationships; higher education; motivation for learning; self-determination theory

Introduction

Positive teacher-student relationships are strong facilitators of a wide range of desirable student-related outcomes including engagement, learning, achievement, well-being, motivation, success, and hope, among others (Wendt & Courduff, 2018; Xie & Derakhshan, 2021; Frymier & Houser, 2000; Havik & Westergård, 2020). Positive relationships and connections that teachers aim to

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create with their students can be defined as teacher-student rapport¹ (Catt, Miller, & Schallenkamp, 2007; Faranda & Clarke, 2004; Frisby & Martin, 2010; Wilson, Ryan, & Pugh 2010). Global research in the field of higher education has shown rapport results in numerous positive outcomes for students. In addition to its favorable effect on students' active participation, self-perceived learning (Frisby & Martin, 2010), and final grade (Wilson et al., 2010), researchers also report a significant and positive correlation between rapport and motivation for learning (Bouras & Keskes, 2014; Clarke, 2004; Frisby & Myers, 2008; Granitz, Koernig, & Harich, 2009; Wilson et al., 2010). In these studies, motivation for learning is defined and measured as a uniform concept, while rapport is understood in a rather inconsistent manner.

While studies on the relationship between teacher behaviors and autonomously regulated learning behaviors in students represent a vital field of research within self-determination theory, most studies focus on children and adolescents (*i.e.*, on primary and secondary school students). The sphere of higher education remains largely unexplored. To fill this gap, this paper focuses on rapport in the context of higher education and its role in students' intrinsic motivation for learning as defined by self-determination theory (Ryan & Deci, 2000a).

A review of the scientific literature on rapport in higher education indicates that numerous imprecise definitions of rapport are used. As such they don't provide possibilities for clear operationalization and development of a psychometric sound measuring instrument. For this reason, a precise model of this phenomenon (for details *see* Bardorfer, 2013) and a psychometrically sound instrument for measuring rapport in higher education (Bardorfer & Kavčič, 2020) was developed.

In conceptualizing teacher-student rapport in the context of higher education, the focus is on the experiential aspect. The phenomenology of the experience of rapport, perceived by students is described in terms of three separate but not independent structural components which apply to higher education: mutual attention, positivity, and coordination. Rapport can be understood as closeness or distance between the teacher and students at the relational and cognitive levels (Bardorfer, 2013).

The positivity component includes a general sense of pleasant interaction between students and the teacher: teacher friendliness and wittiness, a relaxed atmosphere and absence of frustration among students, students' perceptions of the teacher's care and their understanding of the subject matter and progress in the course, students' perception that the teacher is understanding and respectful, and students' sense of a relaxed, appropriately personal but still professional relationship. The component of mutual attention relates to a sense of engagement in interaction, which is reflected in the teacher's willingness to share their own

¹. Due to space constraints, we use the term »rapport« throughout text, referring to student-teacher rapport.

professional experiences with students, interest in and openness to students' opinions, views, and questions, and also includes students' desire to continue working with the teacher, the teacher's efforts to ensure students obtain a solid understanding of the subject matter and his/her accessibility and absence of unpleasant feelings on the part of students when establishing contact with the teacher when seeking help. The coordination component covers coordination in interaction and is reflected in the teacher's patience when working with students and allowing students sufficient time to respond or complete relevant class activities. At the same time, the coordination component also includes coordination in the learning and teaching process, which is reflected in students' awareness and acceptance of course objectives, and in the teacher's willingness to adapt the explanations to students' prior knowledge (Bardorfer, 2013).

The type and level of motivation determine the level of thoroughness of learning and consequently the quality of the achieved results (Marentič Požarnik, 2010). Self-determination theory is the theory of motivation and human needs, which has provided the most influential theoretical background for studies examining the role of interpersonal relationships in motivation within various contexts (La Guardia & Patrick, 2008). It assumes that humans are active organisms with tendencies to grow, overcome the challenges posed by the environment, and integrate new experiences into a coherent self. However, these natural developmental tendencies do not operate automatically but require continuous support from the social environment (Ryan & Deci, 2000a). Ryan and Deci (2000a) provide a schematic presentation of the different types of motivation on the continuum of self-determination (*see* Figure 1). The far-left pole of the continuum is represented by amotivation and the far-right pole by intrinsic motivation. Intermediate stages are represented by different types of extrinsic motivation; the farther to the right we move on this continuum, i.e., progressing from amotivation through four types of extrinsic motivation and to intrinsic motivation, the more the individual experiences motivation as originating from their self, or in other words, the more self-determined they are and the more their behavior is autonomously regulated (Ryan & Deci, 2000a).

Since students do not perceive all course activities as intrinsically interesting, the question arises of how to motivate them to appreciate and self-regulate their academic behavior and complete the required activities without external pressures. The theory of cognitive evaluation focuses on intrinsically motivated behavior and emphasizes the impact of the social context of intrinsic motivation. It also represents a relevant model highlighting the importance of social relations in the educational context, which speaks of three basic needs and features of social environments which affect the fulfillment of these needs in individuals, namely: (a) the need for a sense of competence; (b) the need for autonomy or self-determination, and (c) the need to connect with others. The authors assume that self-regulation of behavior is optimal, *i.e.*, autonomously regulated, when the social context also satisfies these basic needs (Košir, 2013).

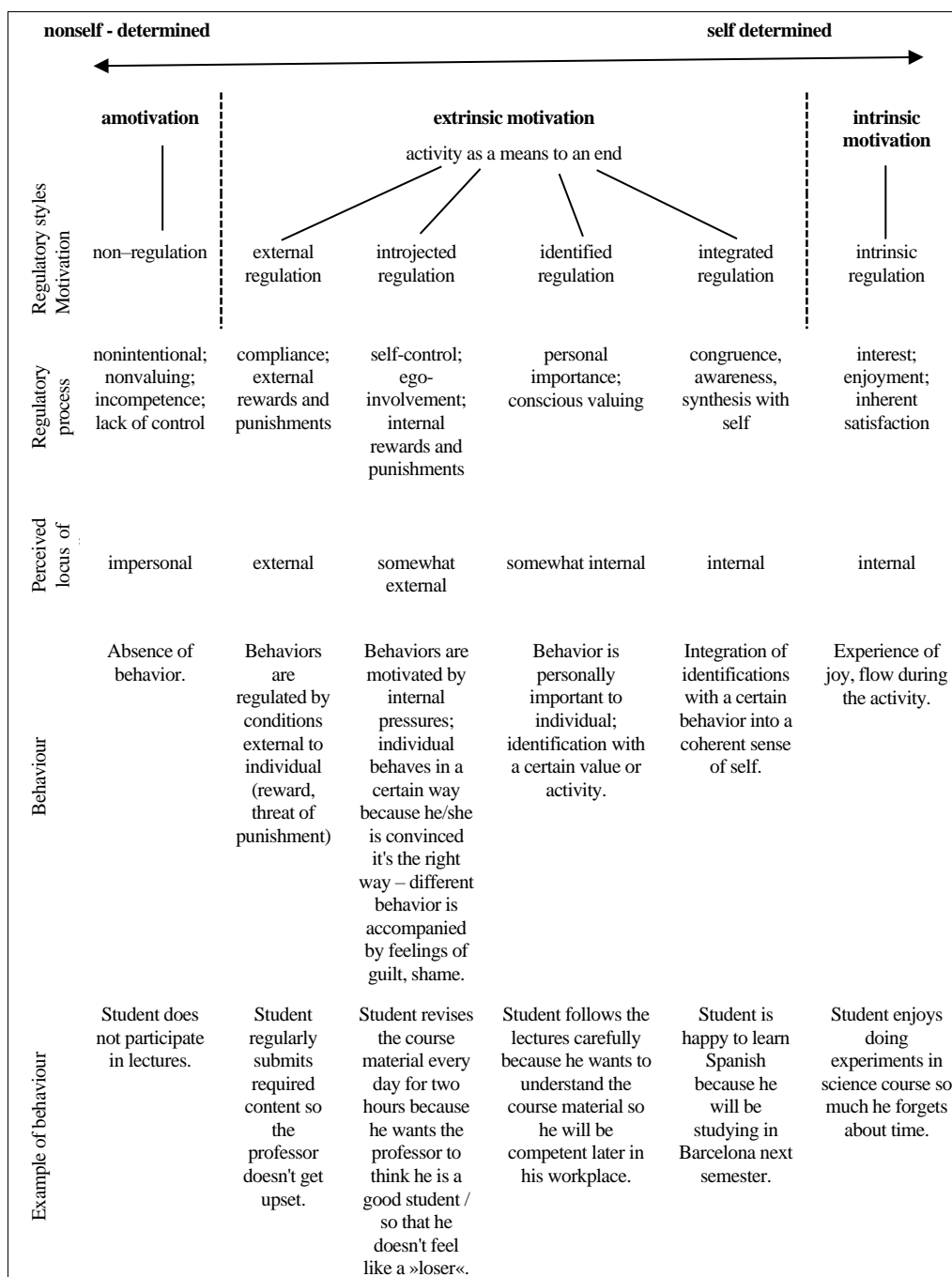


Figure 1. The self-determination continuum showing the types of motivations, their locus of causality, accompanying processes, and descriptions and examples of behaviours (adapted from Košir, 2013; Ryan & Deci, 2000a)

Stroet and colleagues (2013) reviewed relevant studies on the effects of teaching which addresses all three of these needs in early adolescence and found there is a clear positive correlation between teaching style that satisfies students'

need for autonomy, competence, and connection, and their motivation and commitment. We can presume that the academic behaviors of students in higher education are also more autonomous if their social environment supports their basic needs. At any stage of education, learning can therefore take place within a social environment which either supports or thwarts an individual's tendency to actively engage in their learning process and to integrate their learning experiences into a coherent sense of self. The more the social context satisfies the student's three basic needs, the more their (learning) behaviors are autonomously regulated. We propose rapport represents a suitable setting for supporting students' three basic needs. As the leader of the educational process, the teacher can therefore support students' autonomy or self-determination in their process of learning through the establishment and maintenance of rapport.

Empirical studies on rapport in higher education reveal a significant positive correlation between student motivation for learning or their active engagement and rapport (Culpeper & Kan, 2020; Wilson et al., 2010). Furthermore, certain teacher's behavior such as verbal and nonverbal immediacy and caring, that overlap with the definition of rapport (Bardorfer, 2013) used in the current study are also correlated with students' motivation for learning (Frymier & Houser, 2000; Gorham, 1988; Teven & McCroskey, 1997). In the light of self-determination theory, Demir and colleagues (2018) report a significant and positive correlation between rapport and perceived autonomy support. Regarding the basic premise of self-determination theory, the more the social context satisfies one's three basic needs the more autonomously one's behavior is regulated (Košir, 2013), whereby rapport represents the aspect of social context which primarily addresses the need for belonging and to a lesser extent also the need for competence and autonomy, we assumed rapport can significantly affect students' autonomously regulated learning behaviors.

Objective

The aim of the study was to examine whether teacher-student rapport can provide an appropriate social context for fostering students' autonomously regulated learning behaviors. Specifically, we tested the following hypothesis: student-teacher rapport, as perceived by students, significantly predicts students' autonomously regulated learning behaviors, while controlling for several students' characteristics (age, gender, previous academic performance) and several teacher related teaching practices, that are generally included in teachers' evaluation (enthusiasm, breadth of coverage, and organization).

Methods

Participants

A convenience sample of 50 higher education teachers, *i.e.*, teaching assistants, professors, and lecturers (62% women) teaching in natural or social sciences study programmes at three major public universities in Slovenia, aged

25 to 65, whose experience in higher education teaching ranged from under 5 to 25 years and more was used. Table 1 shows the structure of our sample of teachers.

Table 1. Sample of teachers

	Natural sciences		Social sciences		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
University						
University 1	8	53.3	7	46.7	15	30.0
University 2	9	50.0	9	50.0	18	36.0
University 3	8	47.1	9	52.9	17	34.0
Gender						
Male	11	57.9	8	42.1	19	38.0
Female	14	45.2	17	54.8	31	62.0
Age						
25–35 years	5	41.7	7	58.3	12	24.0
36–45 years	9	47.4	10	52.6	19	38.0
46–55 years	5	50.0	5	50.0	10	20.0
56–65 years	6	66.7	3	33.3	9	18.0
Experience in teaching						
under 5 years	6	50.0	6	50.0	12	24.0
5–10 years	7	50.0	7	50.0	14	28.0
11–15 years	5	41.7	7	58.3	12	24.0
16–20 years	2	50.0	2	50.0	4	8.0
21–25 years	1	33.3	2	66.7	3	6.0
over 25 years	4	80.0	1	20.0	5	10.0
Total	25	50.0	25	50.0	50	100.0

A convenient sample of about 30 students per individual teacher was also used. A total of 1682 students (71.5% women) who were present in at least half of the sessions of a particular course taught by the target teacher, aged 18 to 30 years and older, participated in the study. The structure of the student sample is presented in Table 2.

Table 2. Sample of students

	Natural sciences		Social sciences		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
University						
University 1	270	51.8	251	48.2	521	31.0
University 2	285	47.2	319	52.8	604	35.9
University 3	271	48.7	286	51.3	557	33.1
Gender						
Male	330	68.8	150	31.3	480	28.5
Female	496	41.3	706	58.7	1202	71.5
Age						
18–20 years	512	52.6	462	47.4	974	57.9
21–23 years	275	44.3	346	55.7	621	36.9
24–26 years	31	44.9	38	55.1	69	4.1
27–29 years	4	57.1	3	42.9	7	0.4
30 years and older	4	36.4	7	63.6	11	0.7
Total	826	49.1	856	50.9	1682	100.0

Instruments

Instructor-Student Rapport Scale (ISRS; Bardorfer & Kavčič, 2020) describes students' perception of teacher-student rapport. Respondents were asked to grade 35 statements on a 5-point scale (1-Strongly Disagree, 5-Strongly Agree). The authors report high reliability and appropriate constructive and criterion validity of this scale on a sample of Slovene students.

Student Evaluation of Educational Quality Scale (SEEQ; Marsh, 1982) measures nine factors of effective teaching: perceived learning, teacher enthusiasm, organization, peer relationships, rapport, breadth of coverage, examinations, assignments/readings, and difficulty. The statements are equipped with a 5-point scale (1-Strongly Disagree, 5-Strongly Agree). The nine-factor SEEQ structure was validated on a sample of North American students from several different disciplines, with α coefficients of reliability for individual subscales ranging from 0.88 to 0.97 (Marsh, 1982). In our study, we used the following 4 subscales: Breadth of Coverage, which contains 4 statements related to the teacher's competence in the subject matter, presentation of the conceptual background and alternative approaches and theories; Organisation, which contains 4 statements related to the teacher's organization, structure and clarity of explanations, teaching materials and goals; Enthusiasm containing 4 statements relating to the teacher's enthusiasm, energy, wittiness, and ability to sustain students' interest. The scales were translated (double independent translation). α reliability coefficients for the 4 subscales ranged from 0.82 to 0.87 (Bardorfer, 2016).

The Self-Regulation Questionnaire - Academic (SRQ-A; Ryan & Connell, 1989) examines the reasons why students complete class assignments, participate in classes, respond to the teacher's questions, and generally strive to be successful in the course taught by the target teacher. It comprises 32 statements, 9 of which relate to External Motivation, 9 to Internal Motivation, 7 to Identified Motivation, and 7 to Intrinsic Motivation. The respondents were asked to assess the extent to which each statement applied to them (1 - Does not apply at all, 5 - Applies completely). The results can be summarised into a single measure named relative autonomy index (RAI), which expresses the level of autonomously regulated behavior (Grolnick & Ryan, 1987, 1989), *i.e.*, learning the subject matter taught by the target teacher. A higher RAI is indicative of a higher degree of autonomy and vice versa. The questionnaire was translated (double independent translation). Coefficients α for the four subscales ranged from 0.78 to 0.87 (Bardorfer, 2016).

Students were also asked to provide information on their previous academic performance, expressed in the number of points achieved at the state end-of-secondary school examination.

Procedure

Higher education teachers, with published e-mails, from three public universities in Slovenia were sent an invitation to participate in the study. Those who agreed were visited during one of their lessons where the purpose and

objectives of the study were explained. Students who submitted informed consent to participate in the study were familiarised with the purpose and objectives of the study and given precise instructions for completing the questionnaire (paper and pencil). The anonymity of the participants' answers was ensured by the use of codes.

Statistical analysis

Hierarchical linear modeling (HLM) was used to verify the statistical significance of the contribution of several predictors of students' intrinsic motivation for learning the subject matter. Hierarchical structure of our data was accounted for with the use of HLM, where the data from different participants (students) within individual groups (for each target teacher) are correlated (Raudenbush & Bryk, 2002). We used three- and two-level linear models of the HLM 7 software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011), whereby Level 1 was represented by students, Level 2 by groups taught by individual target teachers (target teacher's group level), and Level 3 by universities. Since no significant differences were found between the universities (Level 3) in the RAI criterion variable, we used only two-level linear model.

Results

We anticipated rapport, as perceived by students, would significantly contribute to predicting students' intrinsic motivation for learning the subject matter. The latter was measured using the relative autonomy index (RAI) (Connell & Ryan, 1985, as quoted in Grolnick & Ryan, 1987). As in our case behavior represents learning the subject matter taught by the target teacher, a higher index means a higher degree of autonomous learning in the course taught by the target teacher. We performed HLM analyses on a sample of 1453 students, as 229 out of the total 1682 students did not provide data on their previous academic performance, which was a predictor at the student level (Level 1).

To determine the proportion of variance in RAI that could be attributed to differences between groups of target teachers and differences between students within the same groups first a null model with no predictors included was constructed. In the next step, we compared the model which included predictors at the student level (Level 1) with the null model. As we were interested in the proportion of variance in RAI in learning the subject matter taught by the target teacher that could be explained by rapport, after controlling for students' demographic variables, their previous academic performance, and variables of teaching efficiency of teachers, the following predictors were entered in the model: students' gender, age, previous academic performance, students' perceptions of teacher's enthusiasm, organization and the breadth of coverage, and rapport with the teacher. We analyzed the main effects of the predictors, which we considered to be fixed.

Following the recommendations of Enders and Tofighi (2007, as quoted in Podlesek & Puklek Levpušček, 2011) all predictors were group centered,

except for the variable of gender. We also assumed between group variances of RAI dependent variable didn't differ significantly. As we aimed to compare different models, maximum likelihood estimation was used for the assessment of parameters (Raudenbush & Bryk, 2002).

Table 3. Unexplained variance in the Relative Autonomy Index (RAI) for learning the subject matter taught by the target teacher at the student level and target teacher's group level in different models ($N_{\text{students}}=1453$, $N_{\text{teachers}}=50$)

	Unexplained variance	df	χ^2	p
Null model				
Target teacher's group level	0.94	49	311.27	<.001
Student level	5.74			
Model with student-level predictors (Level 1)				
Target teacher's group level	1.02	49	337.93	<.001
Student level	4.71			

Table 3 shows the unexplained variance at the target teacher's group level and the student level in different models. In the null model, the target teacher's group level variance represented 14% of the total variance in RAI (or $0.94 / [0.94 + 5.74]$), and the student-level variance represented 86% of the total variance ($5.74 / [0.94 + 5.74]$). The differences between RAI in different target teacher's groups were therefore small and represent a lower proportion of the differences in RAI. A larger share of differences between students in RAI can be attributed to the differences between students within an individual group.

When student-level predictors were entered (Level 1), the total unexplained variance decreased by 14% [$1 - [1.02 + 4.71] / [0.94 + 5.74]$]. The individual predictors thus explained a total of 14% of the total variance in RAI. In the model with student-level predictors, the unexplained variance at the student level was 18% lower than that of the null model (*i.e.*, $[5.74 - 4.71] / 5.74$). The model comparison test showed the model with predictors at the student level significantly improved the null model ($\chi^2(7)=2055.53$, $p<.001$).

Table 4 shows the standard parameter estimates reflecting the main effects of predictors. We used standard parameter estimates, which are more appropriate when the number of units is lower than 100 (for an overview, *see* Robust Standard Errors, 2013).

The analysis of the effects of student-level predictors (Level 1) showed that the only statistically significant and positive correlation was between RAI, *i.e.*, the degree of autonomously regulated learning for the course taught by the target teacher, and rapport as perceived by students. Students who rated rapport higher by one point also rated the degree of their relative autonomy in learning the subject matter taught by the target teacher higher by 1.83 points, after controlling for the effects of the remaining predictors in the model. Students' age, gender, and prior academic achievements, as well as variables related to the teacher's teaching efficiency, did not significantly predict RAI.

Table 4. Assessment of the effects of individual relative autonomy index (RAI) predictors for learning target teacher subject matter ($N_{\text{students}}=1453$, $N_{\text{teachers}}=50$)

Parameters in models	Fixed effect estimation of the predictor				
	<i>Coefficient</i>	<i>SE</i>	<i>t</i>	<i>df</i>	<i>p</i>
Intersection	1.82	0.21	8.53	49	<0.001
Student-level predictors					
Gender	0.07	0.20	0.36	1396	0.721
Age	0.07	0.13	0.53	1396	0.597
Previous academic performance	0.03	0.01	1.85	1396	0.065
Teacher's enthusiasm	-0.13	0.11	-1.19	1396	0.235
Teacher's organisation	0.10	0.12	0.86	1396	0.389
Teacher's breadth of coverage	0.14	0.14	1.01	1396	0.313
Rapport	1.83	0.19	9.77	1396	<0.001

Discussion

The results presented in Table 4 support our hypothesis that rapport, as perceived by students, significantly contributes to predicting students' intrinsic motivation for learning the subject matter. Students who perceived the interaction with the teacher as pleasant, without feelings of frustration, and who perceived the teacher as being friendly, witty, respectful, understanding, patient, relatively open, relaxed, and accessible, as well as one who allows students enough time to complete assignments and respond to questions, and is able to adapt explanations to students' prior knowledge, who they perceived as caring about them and their learning progress and was interested in their opinions, comments and questions, and who they themselves wanted to work with in the future, those who were aware of and accepted the learning objectives and perceived the relationship as appropriately personal but still professional, also reported a higher level of autonomous motivation for learning the subject matter. Students who rated rapport higher in terms of quality, compared to students who rated the quality of rapport lower, completed regular academic assignments, participated in classes, tried to be successful in the course taught by the target teacher, and revised the subject matter during the semester, because they found it interesting, fun, in line with their interests, or because they perceived subject matter as important in achieving their own goals, to a higher degree.

As mentioned, the connection between rapport and students' motivation for learning, as defined by the self-determination theory, has not received the attention of researchers in the context of higher education, as researchers in the field of rapport (*e.g.*, Frisby & Myers, 2008; Wilson et al., 2010) focused on the motivation for learning as a single concept, rather than on the dynamics of rapport and students' relative autonomy in learning. Nevertheless, the results of existing studies on rapport in higher education and learning behaviors related to intrinsic motivation are consistent with the results of the present study. For example, Bell and Daly (1984) report rapport significantly determines students' interest in learning the subject matter, whereby they define rapport as a general quality of the teacher-student relationship. A qualitative study conducted by

Granitz and colleagues (2009) amongst higher education teachers also suggests that one of the beneficial outcomes of rapport is the willingness of students to put more effort into the coursework while also enjoying the challenges posed by the teacher, *i.e.*, traits which are closely related to intrinsic motivation and autonomous forms of self-regulation as understood in self-determination theory (Ryan & Deci, 2000a). Similarly, in a systematic review, Orsini and colleagues (2015) concluded results of relevant literature suggest that teachers should interact with their students in a more ‘human-centered’ teaching style, as these actions predict motivational internalization.

The concept of rapport used in current study overlaps in content with the concept of teacher-student relationship and connection, as well as with teacher’s support, for which research at lower levels of education has shown a consistent positive correlation with students’ relative autonomy in learning. As reported by Ryan and colleagues (1994) in a study with elementary school pupils, the quality of the teacher-student relationship predicts pupils’ relative autonomy in learning. Research examining the role of rapport also shows that students’ sense of rapport with the teacher and sense of importance are significantly associated with children’s effort, commitment, and interest in school (Furrer & Skinner, 2003). Moreover, pupils who have a better relationship with the teacher also hold more positive attitudes toward school and are more intrinsically motivated (Skinner and Belmont, 1993). Similarly, according to a study conducted by Murdock (1999) with young adolescents, teacher support predicts students’ effort and level of personal engagement. Therefore, our results are in accordance with previous research findings.

Similarly, also studies in higher education demonstrate interactions between teachers and students both inside and outside the lecture hall produce a positive effect on student motivation. Komarraju and colleagues (2010) found students’ intrinsic motivation for learning was significantly predicted by three types of interactions between students and teachers: respectful interactions, career guidance-related interactions, and informal interactions outside the lecture hall, with respectful interactions statistically significantly and negatively predicting student amotivation. The authors assume such interactions allow students to reflect on their own interests and coursework, and students can obtain answers to their questions, while such interactions also allow them to experience the teacher's enthusiasm for the profession. Informal interactions play an important role, as students who interact with teachers outside the lecture halls also enjoy the courses and perceive teachers as generally stimulating to a higher degree (Komarraju, Musulkin, & Bhattacharya, 2010). These findings are consistent with the results of the present study, as the interactions between teachers and students characterized by respect and accessibility of the teacher inside and outside the lecture hall overlap with the concept of rapport in the context of higher education (Bardorfer, 2013).

The results of the present study can be explained by the autonomy-supportive teaching style. Namely, several studies carried out in the context of

higher education have found a positive correlation between autonomy-supportive teaching style and relative autonomy in student learning (*e.g.*, Black & Deci, 2000; Williams & Deci, 1996). The concept of autonomy support refers to an individual in a position of authority (*e.g.*, the teacher) taking the perspective of another person (*e.g.*, a student), recognizing and acknowledging their emotions and providing them with relevant information and offering choice, thereby minimizing the use of pressure and demands (Deci & Ryan, 1985b, as quoted in Black & Deci, 2000). In a study with medical students undergoing a 6-month practical training on conducting interviews with patients, Williams, and Deci (1996) found students who perceived their instructors as more autonomy-supportive became more autonomous in their learning. Similar results were obtained by Black and Deci (2000), who investigated the role of the autonomy-supportive teaching style in the level of autonomously regulated learning within the course taught by the teacher with undergraduate and postgraduate medical students. The authors (Black & Deci, 2000) report the autonomy-supportive teaching style significantly predicted a positive change in the degree of the relative autonomy of students' learning between the beginning and the end of the semester while controlling for students' general causality orientation, which describes an individual's general tendency towards autonomy, control or amotivation.

Similar results have been reported by researchers who have studied the effects of autonomy support on children at lower levels of education (*e.g.*, Grolnick & Ryan, 1987; Deci, Schwartz, Sheinman, & Ryan, 1981). Specifically, an autonomy-supportive teaching style involves nurturing the inner resources of student motivation, providing information on the relevance and usefulness of course material, using non-controlling language, showing patience, and recognizing and accepting students' negative emotions (Amoura et al., 2015). We assume rapport is an important component of the autonomy-supportive teaching style, as through the latter, students can at least partially meet their three basic needs - belonging, autonomy, and competence. The degree of autonomy or self-determination, however, depends on the fulfillment of these three basic needs, as described in self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000a, 2000b). This assumption is consistent with the results of Demir and colleagues (2018) who report of significant and positive correlation between teacher autonomy support and rapport, as defined by Wilson and colleagues (2010) as a generally good teacher-student relationship.

Teachers who succeed in establishing rapport with their students directly or indirectly support their need for belonging, competence, and autonomy. Teacher involvement is a key component in fulfilling the students' need for belonging. It refers to the quality of teacher rapport with the students and is reflected in the extent to which teachers take time to engage with students, express care, and kindness towards them, enjoy interacting with them, and show a genuine interest in students as individuals, accepting and supporting them, being willing to adapt to their needs, giving them time, energy, and other

resources (Ryan, 1992; Skinner & Belmont, 1993). Within the concept of rapport in higher education used in this study (Bardorfer, 2013) these behaviors are incorporated into the component of positivity. Moreover, teachers can effectively support the need for competence by providing clear information on how to achieve the desired goals, clearly expressing their expectations, responding consistently, predictably, and coherently, providing the necessary support, and adapting their teaching to the developmental level of their students (Skinner & Belmont, 1993). In the definition of rapport in higher education, such behaviors refer to the component of coordination, *i.e.*, coordination in interaction and coordination in the learning and teaching process (Bardorfer, 2013). Teachers can meet students' need for autonomy by providing a certain degree of freedom in choosing certain forms of behavior, *i.e.*, by allowing them to choose between different activities, ensuring there is a connection between the learning activities and students' interests, and by minimizing the presence of external rewards, control, and pressure (Košir, 2013). While teachers who succeed in establishing rapport with their students do not satisfy this need directly, we may assume that rapport sets the stage for students to satisfy their need for autonomy: for teachers to be able to prepare course activities in line with the interests and experiences of their students, they must be familiar with them, which is why such awareness is also an important element of rapport (Bardorfer, 2013).

It seems that not only at lower levels of education but also in higher education, students' learning behaviors are also more autonomous or self-determined provided that their social environment allows them to satisfy their basic needs. We can conclude learning can take place within a social environment which either supports or thwarts an individual's tendency to actively engage in their own learning process and integrate their learning experiences into a coherent sense of self. It seems that through its potential to satisfy the three basic needs of students, rapport may represent an important aspect of the autonomy-supportive teaching style, which can be actively influenced by the teacher.

Conclusions

Given the importance of teacher-student relationships in creating a favorable learning environment for fostering students' learning (Wendt & Courduff, 2018; Xie & Derakhshan, 2021; Frymier & Houser, 2000; Havik & Westergård, 2020) and at the same time the importance of intrinsic motivation for the thoroughness of learning and consequently the quality of the achieved results (Marentič Požarnik, 2010) we aimed to investigate the predictive value of student-teacher rapport on students' autonomously regulated learning behaviors. The study findings suggest that teacher-student rapport significantly predicts students' intrinsic motivation to learn the subject matter. As such the study provides useful information on the effect of rapport on the level of autonomous regulation in learning the subject matter taught by the target teacher in higher

education. At the same time, it also sheds light on the connection between rapport and student motivation for learning, through the lens of self-determination theory, which remains a less explored area in higher education. Results of our study are consistent with the findings of previous research on the positive correlation between rapport and behaviors characteristic of intrinsic motivation (Bell & Daly, 1984; Granitz et al., 2009), as well as with the findings of research in higher education on the positive correlation between interactions between teachers and students, such as respectful interactions, interactions related to career guidance, and informal interactions with students' intrinsic motivation (Komarraju et al., 2010).

Practical implications

The results of the present research suggest important practical implications, as it provides insight into students' motivation for studying the subject matter. Since study matter is not always in line with students' interests and teachers continuously report on low students' motivation (Marentič Požarnik & Puklek Levpušček, 2002) teachers in higher education should strive to establish rapport with students to foster students' intrinsic and autonomously regulated learning behaviors through their own behavior. This could include communicating respect to students, welcoming their contributions to the lesson, not punishing mistakes and not judging misunderstanding and ignorance, being willing to adapt to a certain extent in terms of content and organization, trying to be regular in their behavior, being accessible, share their experiences with students, encouraging getting to know each other and using body language that evokes a sense of security and indicates a democratic attitude (for details *see* Bardorfer, 2017).

Limitations and future research directions

Some methodological limitations of the present study should be noted. First, convenience sampling was used in the study, so the results of the present study cannot be generalized to the entire population of higher education teachers and students in Slovenia but apply only to the sample of teachers and students who participated in the research. The second limitation relates to the measures used. We used self-report measures, meaning that participants were only able to report on those aspects of which they were aware, whereby their responses might have been influenced by their tendency to provide socially desirable responses (Ashton, 2013; Carducci, 2009). Since HLM analyses only provide information on the relationship between predictors and the criterion variables, the results of the present study do not suggest a cause-and-effect relationship between the predictors and the criterion variable. It is therefore possible that the reason some students establish a better rapport with the teacher is that they are more intrinsically motivated or that they exhibit a higher level of autonomy in learning the subject matter. Compared to students who are not intrinsically motivated, students with such initial higher intrinsic or autonomous extrinsic motivation are likely to follow the teacher's lessons more attentively and with greater interest.

It is also likely that teachers respond more positively to such students and show them more support, and as a result, students perceive rapport as stronger.

The latter assumption could be verified in further longitudinal studies, which would measure the differences in the degree of the relative autonomy of students at the beginning and end of the semester and thus directly determine the effect of rapport on the relative autonomy of students in learning the target subject matter. Moreover, it would be useful to investigate if satisfaction and/or frustration of three basic needs in self-determination theory, namely the need for belonging, autonomy, and competence plays a mediating role between teacher-student rapport and the degree of students' autonomous regulation for learning. Future research designs should also measure and control the relationships between students, *e.g.*, classroom climate, as past research has shown that these also influence the desired academic behaviors of students (Frisby & Martin, 2010).

Ethics statement

The study was conducted in accordance with the ethical standards of the institutional research committee, and with the Declaration of Helsinki and its later amendments. Prior to participation in the study, the participants were informed about the purpose of the study, its expected benefits, as well as ethical aspects. Written informed consent was obtained from all participants in the study. Confidentiality and anonymity were assured, therefore, there was no possibility to identify the participants from their responses.

Conflicts of interest

The authors declare no conflict of interest.

Author contributions

A. B. designed the study and conducted the statistical analyses, A. B. and P. D. wrote the manuscript.

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