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DYNAMIC INTERACTIONS BETWEEN TEACHER INVOLVEMENT AND SATISFACTION OF STUDENTS' BASIC PSYCHOLOGICAL NEEDS

Saulė Raižienė (a)*, Renata Garckija (b), Ingrida Gabrialavičiūtė (c)
*Corresponding author

(a) Mykolas Romeris University, Ateities str. 20, Vilnius, Lithuania, s.raiziene@mruni.eu
(b) Mykolas Romeris University, Ateities str. 20, Vilnius, Lithuania, r.garckija@mruni.eu
(c) Mykolas Romeris University, Ateities str. 20, Vilnius, Lithuania, ingrida_gab@mruni.eu

Abstract

The present three-wave longitudinal study explores the importance of teacher need supportive behavior for students' motivational processes. The purpose of this study was to examine the reciprocal associations between teacher involvement and the satisfaction of students' basic psychological needs for autonomy, competence, and relatedness. A total of 795 students from the 9th to the 11th grade with mean age of 16.16 years (49.8% female) completed questionnaires about satisfaction of three basic psychological needs and perceptions of teachers' interpersonal involvement at three measurement points 5 to 6 months apart during one and a half school year. To address main goal a cross-lagged analysis was performed. Results revealed half-year stability and within-time correlations of the study constructs. Cross-lagged effects highlighted that teacher involvement positively influenced the satisfaction of the need for relatedness, while the inverse effect was not significant. Students' perception of higher teacher involvement leads to higher satisfaction of need for relatedness, however the higher level of relatedness need satisfaction does not make students more inclined to perceive their teachers as more interpersonally involved. Findings suggest that educators play an essential role in the development of students' motivational processes, and sustaining warm and caring teacher-student relationships should be a priority for teachers.

Keywords: Teacher involvement, need for autonomy, need for competence, need for relatedness, self-determination theory

1. Introduction

In seeking to understand the dynamic of productive classroom environment, much of the literature on educational psychology has focused on the teacher-student relationships. These connections are considered especially potent because of the many roles teacher plays, for example, as a potential attachment figure, as a pedagogue, as a disciplinarian, and as the final arbiter of a student's level of performance (Furrer & Skinner, 2003). The importance of caring and closeness in student–teacher relationships has been documented in various studies (Deci, Vallerand, Pelletier, & Ryan, 1991; Furrer & Skinner, 2003; Maulana, Opdenaker, Stroet, & Bosker, 2013; Maulana, Opdenakker, den Brok, & Bosker, 2011; Wentzel, 1997, 1999). In adolescence, students' reports of teacher caring predict changes in motivational outcomes over 2 years, even after controlling for previous academic performance and perceived control (Wentzel, 1997).

These caring and close student-teacher relationships are also referred to as teacher involvement. Involved teachers take time to help and support students through learning process, express affection, show enjoyment during classroom interactions, are attuned to, and dedicate resources to their students (Connel & Wellborn, 1991). Feeling special and important to teachers is hypothesized to „trigger energized [students'] behaviour, such as effort, persistence, and participation; to promote positive emotions, such as interest and enthusiasm; and to dampen negative emotions, such as anxiety and boredom" (Furrer & Skinner, 2003, p.149). Overall, studies have demonstrated that teacher involvement can serve as energizing agent and protective factor for maintaining high quality motivation and engagement of students. However, it is still much to learn about the mechanisms that teacher involvement play in providing their students with optimal learning environments.

Self-determination theory (SDT; Deci & Ryan, 1985; Deci & Ryan, 2000) has been useful in explaining the mechanisms through which the social context (i.e. teacher involvement) shapes students' classroom experience. SDT posits that in order for individuals to be energized, curious and fulfil their full potential, the three basic psychological needs for autonomy, competence, and relatedness should be satisfied. In educational settings, the need for autonomy can be defined as the experience of choice and volition in study activities. The need for competence implies that individuals seek to be effective and experience confidence in performing necessary actions and achieving desired outcomes (Deci & Ryan, 2000; Deci & Vansteenkiste, 2004). The need for relatedness concerns a sense of connection with teachers and classmates (Deci & Ryan, 2000; Sierens, Vansteenkiste, Gossens, Soenens, & Dochy, 2009; Tian, Han & Huebner, 2014). SDT posits that even though basic psychological needs are innate necessities, social contexts should provide opportunities for satisfying the needs. When the social context fulfils students' basic psychological needs (e.g. by expressing affection, dedicating resources, and liking students), positive outcomes such as engagement, high academic achievements and well-being are optimized (Deci & Vansteenkiste, 2004).

The need supportive behaviours are autonomy support, structure (i.e. competence support), and interpersonal involvement (i.e. relatedness support) (Deci & Ryan, 2000). The majority of SDT research has been focused on the extent to which teacher behaviour satisfy the needs for autonomy and competence, less is known about the interpersonally involving behaviours expressed by teachers (Sparks, Dimmock, Whipp, Lonsdale, & Jackson, 2015). Teacher involvement according to Skinner and Belmont

(1993) shapes not only the extent to which students feel their need for relatedness is satisfied, but their needs for competence and autonomy as well.

SDT based empirical studies have established the links between teacher involvement and various educational outcomes. The effects of teacher involvement were studied cross-sectionally (e.g. Zhang, Solmon, & Gu, 2012) as well as longitudinally (e.g., Koka, 2013, Maulana et al., 2013). It is worth noting that only the latter studies allow to explore the dynamic nature of how teacher involvement shapes students' outcomes. Maulana et al. (2013) established that teacher involvement played an important role in prevention of higher levels of controlled motivation. However, the person-oriented methodological approach they used did not allow to determine the direction of these effects. Koka (2013) demonstrated unidirectional relationship between teacher social support and students' autonomous and controlled motivation. However, the stability of the relationship was not proved because the study constructs were measured on only two time points.

2. Problem Statement

Most of the available cross-sectional and longitudinal studies used students' motivation as an outcome of teacher involvement. We were unable to find studies that directly link the teacher involvement and satisfaction of basic psychological needs. However, basic psychological needs are considered the proxy indicators of students' motivation and therefore have to be analysed in relation to teacher behaviour.

Although theoretical considerations and findings from previous studies emphasise the importance of teacher involvement for students' academic outcomes, there is still much to learn about directionality and stability of this relationship. According to SDT, the relationships between teacher involvement and satisfaction of basic psychological needs can be bidirectional. This would be in line with sensitization hypothesis, that suggests that individuals with a history of need satisfaction are more sensitive to new opportunities for need satisfaction (Moller, Deci, & Elliot, 2010). Therefore, one can expect that not only perception of teacher involvement affects the satisfaction of needs, but also the satisfaction of needs can influence the perception of teacher involvement.

3. Research Questions

The present study aimed to answer the following research question: what is the direction of the relationship between teacher involvement and students' satisfaction of need for autonomy, competence and satisfaction? We expected bidirectional effects between teacher involvement and need satisfaction. Specifically, we hypothesised that teacher involvement would positively predict students' need satisfaction and the other way around.

4. Purpose of the Study

The goal of current study was to examine the reciprocal associations between teacher involvement and the satisfaction of basic psychological needs for autonomy, competence, and relatedness.

5. Research Methods

5.1. Participants and procedure

The data was drawn from the ongoing longitudinal research "Towards effective teaching: Dynamic interaction between teachers' instructional behaviour and students' basic psychological needs satisfaction (DoIT)". We collected data from seven high schools in four districts representing all regions of Lithuania. Students from the 9th to the 11th grade (32.6% in the 9th grade, 36.4% in the 10th grade, 31.1% in the 11th grade) completed a battery of paper-and-pencil questionnaires at three measurement waves 5 to 6 months apart during one and a half school year. Before the start of the study, the parents of selected students received written information about the research via electronic day-book. In case they objected the participation of their child in the study, parents were asked to contact the leader of the research team (i.e., a passive informed consent was obtained). Researchers provided information for adolescents about the study, and that participation was voluntary and confidentiality was assured before questionnaires administration. Students who agreed to participate in the study completed the questionnaires during regular class time under the supervision of the researcher. Teachers were not present at classrooms during data collection.

The total number of participants was 795 adolescents (49.8% female; n_{Time1} = 682; n_{Time2} = 686; n_{Time3} = 680) with a mean age of 16.16 years (SD = .91). Most participants were Lithuanian (90.2%). Others were from Polish (2.4%), Russian (1.4%), and other language-minority families (.8%). 5.3% did not specify ethnicity.

5.2. Measures.

The questionnaires for present study were translated from English to Lithuanian, the participants' language of instruction at school, using the guidelines of the International Test Commission (Hambleton, 1994).

Basic psychological need satisfaction at school. Basic psychological need satisfaction at school was assessed with three subscales (autonomy satisfaction, competence satisfaction and relatedness satisfaction) from the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS, Chen et al., 2015). We used the version of this scale that was modified for children by Van der Kaap-Deeder et al. (2015). For the present study the stem "At school…" was added before items. All 12 items (4 items per need) were rated on a 5-point scale (1- completely untrue, 5- completely true). Sample items are: "I feel free to choose which activities I do" (autonomy satisfaction), "I can do things well" (competence satisfaction), "The people that I like, also like me" (relatedness satisfaction). Cronbach's Alphas for the subscales ranged between .66 and .76 at T1; between .66 and .77 at T2; and between .71 and .78 at T3.

Teacher involvement. Students' perception of their teachers' involvement was assessed by the Involvement subscale of the short version of the Teacher as Social Context Questionnaire (TASC-Q, Belmont, Skinner, Wellborn, & Connell, 1988). The Involvement subscale consists of 7 items (e.g., "My teachers like me") that were rated on a 5-point scale (1 -not at all true, 5 - very true). Cronbach's Alphas for the Involvement subscale was .83 at T1, .85 at T2 and .86 at T3.

6. Findings

6.1. Preliminary analyses

The data screening revealed that overall 14.44% of data were missing at Time 1 – Time 3. The range of missing items varied from 14.19% to 14.90% across the three waves. Little's (1988) Missing Completely at Random (MCAR) test on the variables of interest yielded a normed $\chi2$ ($\chi2/df$) of 1.18. According to the guidelines by Bollen (1989), this indicates that data were probably missing at random. Thus, all participants were included in the analyses conducted by means of full information maximum likelihood (FIML) procedure available in Mplus 7.31 (Muthén & Muthén, 1998 - 2017). FIML uses all available information (including information from participants with missing data) to estimate model parameters and produces more efficient parameter estimates compared to other methods (Enders, 2010).

Means and standard deviations for study variables are reported in Table 1. Correlations among study variables are reported in Table 2. At all time-points teacher involvement related positively to satisfaction of three basic psychological needs (correlation coefficients ranging from .16 to .35).

As a preliminary step, we tested longitudinal measurement invariance. First, we tested longitudinal invariance for the overall measurement model. We compared the configural (baseline) model with the metric model in which factor loadings were constrained to be equal across time. Results indicated the establishment of configural and metric invariance for the measurement model across time.

Table 1. Descriptive statistics for study variables

Variables	Descriptive statistics		
	Time 1	Time 2	Time 3
	M (SD)	M (SD)	M (SD)
Teacher involvement	3.40 (.65)	3.43 (.66)	3.42 (.67)
Autonomy satisfaction	3.28 (.68)	3.27 (.67)	3.21 (.72)
Competence satisfaction	3.68 (.54)	3.68 (.54)	3.68 (.56)
Relatedness satisfaction	4.01 (.60)	3.97 (.62)	4.00 (.58)

Table 2. Correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11
1 TeaInT1	-										
2 AutonT1	.29	-									
3 CompT1	.29	.36	-								
4 RelT1	.16	.22	.31	-							
5 TeaInT2	.63	.26	.25	.15	-						
6 AutontT2	.26	.52	.21	.16	.35	-					
7 CompT2	.27	.27	.59	.22	.30	.36	-				
8 RelT2	.24	.22	.25	.51	.30	.31	.37	-			
9 TeaInT3	.62	.26	.26	.16	.66	.29	.28	.28	-		
10 AutonT3	.24	.48	.27	.05^{ns}	.28	.57	.30	.17	.28	-	
11 CompT3	.25	.27	.54	.13**	.29	.31	.62	.28	.29	.40	-
12 RelT3	19	.17	.24	.42	.22	.24	.31	.55	.22	.24	.39

Note. TeaIn - Teacher involvement; Auton - Autonomy need satisfaction; Comp – Competence need satisfaction; Rel – Relatedness need satisfaction; T1 - Time 1; T2 -Time 2; T3-Time 3. $p < .001$; ** $p< .01$; $^{n.s.}$ $p > .05$.

6.2. Main analyses

The purpose of this study was to examine reciprocal associations between teacher interpersonal involvement and satisfaction of three basic psychological needs. To address this aim we conducted a cross-lagged analysis in Mplus, i.e. we tested for cross-lagged associations between teacher interpersonal involvement and satisfaction of three basic psychological needs (e.g., teacher involvement measured at T1 predicting satisfaction of each need at T2 and satisfaction of each basic psychological need at T1 predicting teacher involvement at T2). Half and one-year stability paths (e.g., teacher involvement at T1 predicting teacher involvement at T2; teacher involvement at T1 predicting teacher involvement at T3) and within-time correlations among all the variables were controlled for.

The model we tested consisted of four latent variables at each wave: teacher involvement (with three parcels of items as indicators) and satisfaction of the need for autonomy, competence and relatedness (with four items for each need serving as the observed indicators). The model was estimated with the robust maximum likelihood estimation method (MLR; Satorra & Bentler, 1994). To assess the model fit, the Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) were used. The values higher than .90 for CFI and values lower than .08 for RMSEA are indicative of an acceptable fit (Byrne, 2012).

To model the reciprocal associations between teacher involvement and satisfaction of needs as parsimoniously as possible, we tested whether cross-lagged effects and within-time correlations (correlated changes) were time invariant (i.e., assumption of stationarity). Thus, we compared the baseline unconstrained model (M1) with model assuming time invariance of cross-lagged paths (M2) and with model assuming time invariance of T2-T3 within-time correlations (M3). To determine significant differences between the two models at least two out of these three criteria had to be matched: $\Delta\chi^2$ significant at $p < .05$, ΔCFI $\geq -.010$, and ΔRMSEA $\geq .015$. Results indicated that models assuming time invariance were not substantially different from the model in which these effects were allowed to vary across time (see Table 3). Thus, the assumption of time invariance for the model was supported and we could retain the more parsimonious model (M4) with time-invariant cross-lagged paths and within-time correlations as the final one. The final model fit the data very well (Table 3). Significant paths and correlations are reported in Figure 1.

Table 3. Cross-lagged models: fit indices and model comparisons

Models	Model fit indices				Model comparisons		
	χ^2	df	CFI	RMSEA[90%CI]	$\Delta\chi^2$	ΔCFI	ΔRMSEA
M1: Baseline model	1669.635***	879	.916	.034 [.031, .036]			
M2: Model with cross-lag paths fixed to be time invariant	1686.370***	891	.915	.034 [.031, .036]	16.74	-.001	0
M3: Model with T2-T3 within time correlations fixed to be time invariant	1671.445***	885	.916	.033 [.031, .036]	1.81	-.001	-.001
M4: Final model with cross-lagged paths and within-time correlations fixed to be time invariant	1686.884***	897	.916	.033 [.031, .036]	17.25	0	-.001

Results revealed that half-year stability ranged from moderate to large and one-year stability ranged from small to modetare (with exception for competence satisfaction). Furthermore, concurrent correlations pointed to significant positive associations between teacher involvement and satisfaction of three basic psychological needs. These findings were consistent across measurement points.

Cross-lagged effects highlighted that teacher involvement influenced satisfaction of the need for relatedness, while the inverse effect was not significant. Specifically, teacher involvement positively predicted relatedness need satisfaction over T1 – T3. No significant effects from students' relatedness need satisfaction to teacher involvement were found.

With this study, we sought to provide new insights to the literature on teacher-student relationships. Existing body of research suggests that teachers' classroom behaviour is an energizing agent and protective factor for high quality academic motivation, engagement in school activities and psychological well-being (Opdenakker, Maulana, & den Brok; 2012). We aimed to examine the directionality of effects between teacher involvement and satisfaction of students' basic psychological needs. We addressed this goal in a fully recursive three-way longitudinal study involving late adolescents over one-year period.

Even though we found teacher involvement related to satisfaction of each basic psychological need at each time point, these links were not reciprocal, contrary to what was expected. These results suggest that teacher involvement affects the satisfaction of need for relatedness over time but not vice versa. In other words, the perception of greater teacher involvement influences higher subsequent levels of satisfaction of need for relatedness, however the higher level of relatedness need satisfaction does not make students more inclined to perceive their teachers as more interpersonally involved. These results are in line with SDT that teacher involvement is considered need supportive behaviour for relatedness.
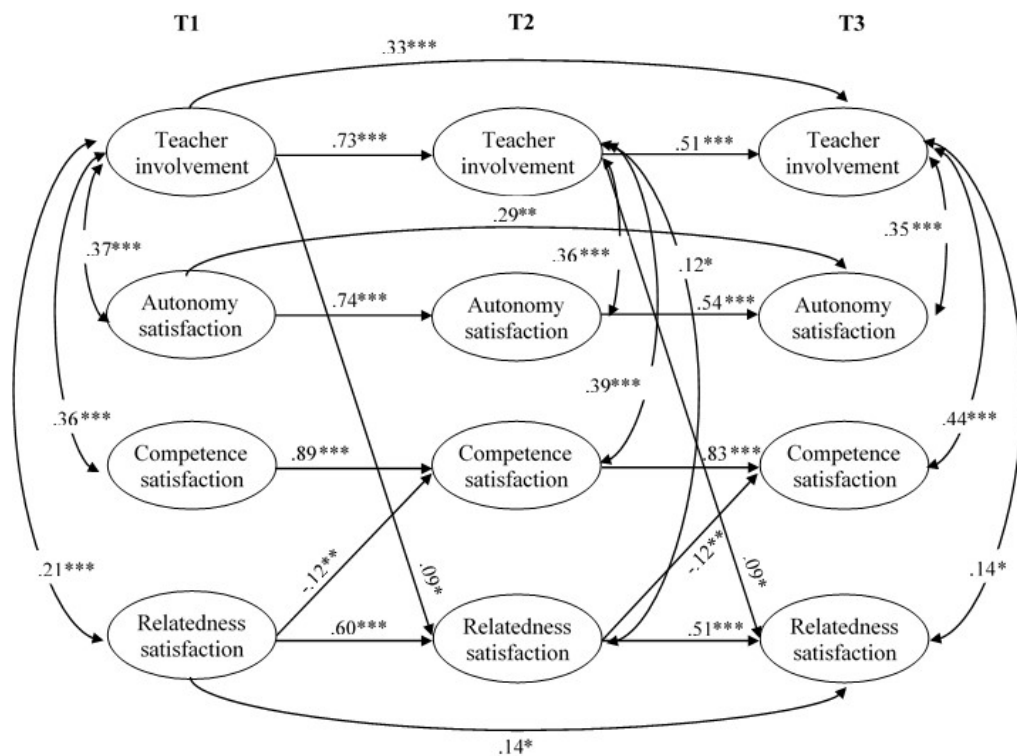

Figure 1. Cross-lagged associations among teacher involvement and need satisfaction variables.
*p < .05, **p < .01, ***p < .001

Results of this study should be considered in light of few limitations. In our study, we analysed only one type of need supportive behaviour – teacher involvement. However, in reality teacher demonstrates an array of various need supportive behaviours, therefore the influence of teacher involvement on need satisfaction should be analysed together with other aspects of teacher behaviours. Another limitation is a correlational nature of the study that does not allow to make causal inferences. Third, students self-reports have been used to test our hypothesis. In other words, only students' perceptions of teacher involvement was measured in this study, not actual involvement. It would be useful to include observed evaluations of teachers' classroom practices.

7. Conclusion

To conclude, the results proved unidirectional relationships between teacher involvement and relatedness need satisfaction over time, i.e. teacher involvement increases the relatedness need satisfaction over six-month period. Results of this study invite educators to create and sustain warm and caring relationships with students during educational process as this assists in keeping students motivated and engaged. The role of teacher is not limited to delivering knowledge about the subject, it is much broader as teacher serves as facilitator of development of students' motivational processes.

Acknowledgments

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