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Mentors and teachers: testing the effectiveness of simultaneous roles on school performance from a basic psychological needs perspective

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Abstract The mentor's background in educational roles has been presented as a moderator of School-Based Mentoring (SBM). However, the analysis of overlapping mentoring and teaching roles has been underemphasized in the literature. The aim of this study is to test whether the combination of mentoring and teaching roles influences the mentees' school performance, within a Portuguese SBM program. A three-stage experimental study was conducted in order to compare mentored (n = 157) and non-mentored students (n = 160) enrolled in formal basic education (5th to 8th grades). Multivariate Analyses of Covariance (MANCOVA) revealed that the combination of mentoring and teaching roles was effective in reducing the mentees' unexcused absences and in improving their grades in Portuguese language and math as well as their Grade Point Average (GPA) compared to equivalent non-mentored students. Further analyses demonstrated that an increased satisfaction of the mentored students Basic Psychological Needs (BPN) promoted better school performance outcomes when compared with non-mentored students with an identical perception of BPN support. However, mentored students that experienced an increased satisfaction of BPN had marginally significantly worse Grade Point Average (GPA) than the mentored students that perceived less or similar BPN support within SBM. These mixed trends are discussed and recommendations are made for a more balanced support of BPN in SBM relationships and across the different relationships held between the mentees and other teachers, in order to foster an improvement of school performance.

Keywords School-based mentoring · Teaching · Basic psychological needs

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Introduction

The improvement of vulnerable children and adolescents' school performance is a major concern of educational systems. As students, these youths present an increased risk of having a poor school performance in terms of behavioral problems, chronic absenteeism and grade retention which can ultimately result in early school dropout (Edwards et al. 2007). The effects of premature school dropout are particularly persistent across the lifespan: early school leavers are more likely to face unemployment, to have lower incomes and to present poorer self-esteem (Dooley and Prause 1995). The consequences of school failure have led political decision-makers, communities and researchers to make major efforts in order to enhance teaching and learning methods, as well as the quality of social support delivered to vulnerable students. One of the most popular interventions currently in use to improve vulnerable students' school performance is School-Based Mentoring (SBM).

SBM is the fastest-growing form of programmed mentoring (Randolph and Johnson 2008). Its growing diffusion relies on the premise that positive relationships with at least one adult promote a youth's potential by fostering his or her sense of belongingness, competence and autonomy (Zimmermann et al. 2002). The benefits of a positive relationship with an adult reference have been particularly emphasized in the case of more vulnerable children and adolescents. Children and adolescents who have experienced adversities in their lives may find in SBM an opportunity to compensate losses in previous relationships with adults and to overcome personal, social and academic failures (Rhodes et al. 2006).

SBM is usually more successful in improving the mentees' school performance than, for instance, natural mentoring and community-based mentoring (DuBois et al. 2002). Some findings have specifically associated SBM with an improvement in school achievement (Converse and Lingnugaris/Kraft 2009; Herrera et al. 2011; Portwood et al. 2005), reading and writing skills (Caldarella et al. 2009), perceptions of competence for learning (Grossman and Johnson 2002; Herrera et al. 2011) or school-related behaviors, such as a decrease in the numbers of truancy (Wheeler et al. 2010), especially when SBM relationships last more than 6 months (Grossman et al. 2012) and disciplinary referrals (Converse and Lingnugaris/Kraft 2009; Kolar and McBride 2011). However, positive SBM effects on academic-related variables are not systematic. For instance, some findings did not associate SBM with better school grades (Karcher 2008; Russell 2007), while others have demonstrated that SBM only provided marginal improvements in this area (Dappen and Isernhagen 2006). In addition, some meta-analyses depicted that the magnitude of SBM impact ranged from non-existent (Wood and Mayo-Wilson 2012) to modest, but significant (DuBois et al. 2002).

These mixed findings associated to SBM are affected by several factors. The variability in the implementation of SBM programs (DuBois et al. 2011), the mentees' characteristics such as gender (Darling et al. 2006) or the level of relational risk (Schwartz et al. 2011), and practical issues such as appropriate matching (Karcher 2008) or the duration of SBM relationships (Grossman et al. 2012) are important moderators of SBM outcomes. The mentors' background in caring and educational roles has also been depicted in the literature as one of the most important moderators of the effectiveness of SBM (DuBois et al. 2002). However, experienced educators are rarely involved in SBM programs (Larose et al. 2005). Therefore, new research efforts are required to understand the effectiveness of SBM in improving the mentees' school performance, especially when mentoring is delivered according to unusual premises such as the combination of mentoring and teaching roles.

SBM and teaching

Mentoring involves asymmetrical as well as symmetrical interactions (Spencer 2006). The predominance of asymmetrical interactions is usually associated with a prescriptive relationship style; the mentor's main intention is to reduce the mentee's deficits, by helping him or her to accomplish certain developmental tasks (Deutsch and Spencer 2009; Karcher and Nakkula 2010). Conversely, more recurrent symmetrical interactions are typically related to a developmental or a growth-orientated relational style. In this case, the mentor's aim is to promote the mentee's potential, through interpersonal features such as trust, companionship or empathy (Karcher and Nakkula 2010; Spencer 2006). SBM tends to be less effective if clear-cut and attainable goals are not defined (Karcher 2008) or if there is a disproportionate emphasis on helping the mentees to overcome their flaws (Spencer 2006). Thus, a more comprehensive mentoring style that helps to reduce the mentees' deficits, while encouraging personal growth, is the most suitable approach to address the mentees' needs (Spencer 2006).

The specific relationship between mentoring and teaching is complex. In contrast to teaching, mentoring involves formal and informal learning strategies, more extensive caring features and does not rely on grading or a formal evaluation process (Goldner and Mayseless 2008). However, mentoring and teaching also share obvious similarities: both are dyadic relationships, and both entail learning goals and tasks. In fact, an important part of mentoring is supposed to be based on setting academic aims, assisting with homework or preparing tests. Nonetheless, according to some findings, only approximately one-quarter of school mentors admitted to spending the majority of time completing homework or studying with the mentees (Herrera et al. 2007).

The mentors' background in educational or caring roles seems to influence the amount of support provided for learning issues (DuBois et al. 2002; Rhodes et al. 2006). Thus, teachers may be in a privileged position to mentor, because of their educational experience, further extending the connections between mentoring and teaching (Darling et al. 2006). However, the benefits of a strong interconnection between mentoring and teaching are not straightforward. It is reasonable to expect that mentors that also instruct their mentees may be more effective in reducing the academic deficits of the latter. However, there are logical risks associated with overlapping mentoring and teaching as well: mentors may overly focus on learning issues, resulting in more difficulties in combining asymmetrical and symmetrical interactions. Some findings contradicted these concerns, suggesting that teachers are more effective than parents and peers in promoting adolescents' school achievement (Niemiec and Ryan 2009) and well-being (Chu et al. 2010). In addition, it has also been demonstrated that mentors that also taught their mentees facilitated the social adjustment and institutional connectedness of their mentored students (Larose et al. 2005).

SBM and basic psychological needs theory

The Basic Psychological Needs (BPN) theory is one of the five sub-theories that uphold the macro-theoretical model known as the Self-Determination Theory (Vansteenkiste et al. 2009). The key assumption in the BPN theory is that personal development and the resolution of internal inconsistencies vary according to the level of satisfaction of three BPN: relatedness, autonomy and competence (Deci and Ryan 2000, 2008). The need for relatedness involves a personal orientation to establish strong and stable interpersonal bonds that promote a sense of being understood and accepted by others. The need for autonomy refers to self-initiation, volition and willing endorsement of one's behavior. The

need for competence is an experience of effectiveness in one's pursuits (Deci and Ryan 2000). Although these needs are distinct, in natural contexts they tend to act together such that BPN can be evaluated as a whole (Bartholomew et al. 2011; Van den Broeck et al. 2010).

BPN theory seems to be an appropriate model for contextualizing SBM relationships. Firstly, such theoretical background helps to contradict the characterization of SBM as a unidirectional flow of support provided by mentors (Russell 2007). In fact, SBM outcomes are shaped by both the mentors' and mentees' characteristics and behaviors. Secondly, the descriptions of SBM relationships have rarely been based on well-established theoretical frameworks that capture the complexity and diversity of the roles played by mentors (Goldner and Mayseless 2008). Thirdly, it is important to emphasize that SBM is by definition a relational framework directed towards the development of the mentees' potential as mentioned above (Zimmermann et al. 2002). In accordance, BPN theory's underlying assumptions formulate the conditions under which each mentee may realize his or her individual potential. Moreover, our theoretical approach is consistent with previous suggestions to incorporate new theoretical views into the field of SBM research, in order to more fully understand how mentors can create conditions that promote the effective developmental growth of their mentees and how mentees can affect the quality and amount of social support provided by mentors (Larson 2006; Russell 2007).

Finally, in the context of this study, it is relevant to underline that increasing satisfaction of BPN has been associated with higher academic achievement (Jang et al. 2009; Sheldon and Krieger 2007). A balanced satisfaction of BPN across different relationships has also been associated with fewer intents to drop out and more positive perceptions of self-efficacy (Milyavskaya et al. 2009). Therefore, it seems reasonable to assume that increasing and balanced satisfaction of BPN in SBM will lead to better school performance as well.

The current study: objectives and hypotheses

Our main purpose is to examine the impact of SBM on improving the mentees school performance, where SBM is provided by teachers who are also instructors to the mentees. We include in the definition of school performance three types of indicators: school grades, disciplinary referrals, and unexcused absences. We designed a three-stage experimental study to accomplish this aim. The first assessment (time point 1) was made before the end of the school year previous to the implementation of the SBM program. The second assessment (time point 2) was made the following school year, two months after the SBM program was implemented. The third assessment was made six months later, by the time the program was completed (time point 3).

Two specific goals arise from our central research purpose. The first goal is to test the impact of satisfying BPN in SBM relationships delivered by teachers on improving their mentees' school performance. Accordingly, two hypotheses are tested:

Hypothesis 1 Mentored students will have better school grades, lower numbers of disciplinary referrals and a lower number of unexcused absences than non-mentored students, between the first and third assessment points;

Hypothesis 2 The satisfaction of BPN will significantly influence the mentored students' school performance regardless of the mentoring, between the same assessment points.

Our second goal is to test whether opposite levels of perceived BPN satisfaction (unchanged/lowered or increased satisfaction throughout the program) are differentially associated with mentee outcomes in the selected indicators of school performance. We examine five hypotheses which are organized into two major categories. First of all, we expect that more positive perceptions of BPN will lead to better school performance indicators. Therefore, we hypothesize that:

Hypothesis 3 Mentored students who experience increased satisfaction of BPN between the first and third assessments will exhibit significantly better outcomes in school performance indicators than equivalent non-mentored students;

Hypothesis 4 The same mentored students will demonstrate significantly better results in the targeted dependent variables of school performance than non-mentored students;

Hypothesis 5 These mentees will also exhibit better results in the same group of selected school performance indicators than the remaining mentees who perceived less or unchanged satisfaction of BPN;

Hypothesis 6 Similarly, non-mentored students who felt increased satisfaction of BPN between the first and third assessments will have significantly better outcomes in targeted school performance indicators than non-mentored students with opposite levels of BPN satisfaction.

We also hypothesize that if mentee BPN satisfaction is not realized, their school performance will not show significant improvements. Specifically, we expect that:

Hypothesis 7 No significant differences will be found between mentored students who consider themselves less or similarly supported in their BPN and non-mentored students in an identical level of BPN satisfaction, regarding school performance indicators;

Hypothesis 8 No significant differences will be found between mentored students who perceive less/unchanged BPN satisfaction and mentored students who feel an increased support for their BPN, regarding the same indicators.

Figure 1 synthesizes our assessment plan.

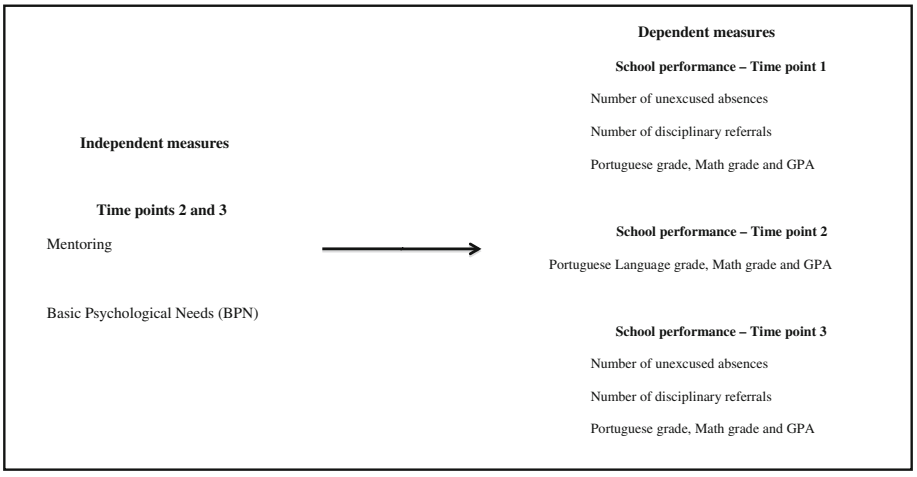

Fig. 1 Assessment plan–independent measures, dependent measures, and assessment points

Methods

Participants

The participants in this study were students enrolled in six schools of the Portuguese public educational system that implemented the *Metodologia TUTAL*. Five hundred and fifty-one potential participants were integrated into 27 classes assigned to the study by their respective school boards. The classes were randomly assigned to either the mentored or the non-mentored group. We used simple random distribution in order to assign the classes evenly for each of the preexisting conditions (Schulz and Grimes 2002). Most of the students met at least one of the four inclusion criteria: recommendation for supplementary classes, grade retentions, absenteeism or a record of disciplinary referrals. From the 551 potential participants, 53 did not meet at least one of the criteria and were excluded from the study. A total of 181 students either did not complete the surveys at time points 2 or 3 or did not receive authorization from their legal representatives to participate in the research. The final sample included 317 students, representing a participation rate of 63.7 %.

According to Table 1, of the total 317 participants, 157 (49.5 %) were mentored students ($M = 12.75$, $SD = 1.75$) of whom 90 (57.3 %) were female, and 93 (59.2 %) attended classes at the third level of basic education; 131 (83.4 %) were recommended for supplementary classes, 126 (80.3 %) had a record of prior retentions, 115 (73.2 %) had school attendance problems and 47 (30.5 %) had a record of disciplinary referrals. The non-mentored group comprised 160 students (50.5 %) ($M = 12.06$, $SD = 1.81$) of whom 91 (56.9 %) were female and 91 (56.9 %) attended classes at the second level of basic education; 125 (78.6 %) were recommended for supplementary classes, 85 (53.1 %) had a record of prior retentions, 116 (72.5 %) had school attendance problems and 29 (20.4 %) had a record of disciplinary referrals.

According to Table 2, 88 (56.1 %) of the mentored students perceived an increased satisfaction of BPN between the assessment points (M age $= 12.61$, $SD = 1.77$) of whom 53 (60.2 %) were female, 57 (64.8 %) attended classes at the second level of basic education, 73 (83.0 %) had been indicated to attend supplementary classes, 20 (22.7 %) had been previously retained, 26 (29.6 %) had a record of absenteeism and 27 (30.7 %) had a disciplinary record. Conversely, 69 (43.9 %) of the mentored students experienced lower or unchanged satisfaction of BPN between the second and third assessment points

Table 1 Mentored and non-mentored students' demographic and individual risk characteristics

	Mentored students ($n = 157$)	Non-mentored students ($n = 160$)
Gender–M (*F*)	67 (*90*)	69 (*91*)
Age–M (*SD*)	12.75 (*1.75*)	12.06 (*1.81*)
Educational level–second level (*third level*)	93 (*64*)	91 (*69*)
Risk factors		
Supplementary classes	131 (83.4 %)	125 (78.6 %)
Prior retentions	126 (80.3 %)	85 (53.1 %)
Absenteeism	115 (73.2 %)	116 (72.5 %)
Disciplinary record	47 (30.5 %)	29 (20.4 %)

($M = 12.91$, $SD = 1.71$) of whom 37 (53.6 %) were female, 36 (52.2 %) attended classes at the second level of basic education; 58 (84.1 %) had been indicated to attend supplementary classes, 11 (15.9 %) had been previously retained, 53 (76.8 %) had a record of absenteeism and 49 (71.0 %) had a disciplinary record.

Table 2 also depicts that 61 (38.1 %) of the non-mentored students perceived an increased satisfaction of BPN between the assessment points ($M = 12.03$, $SD = 1.76$) of whom 35 (57.4 %) were male and 31 (50.8 %) attended classes at the third level of basic education; 42 (68.9 %) had been indicated to attend supplementary classes, 30 (49.2 %) had been previously retained, 41 (67.2 %) had a record of absenteeism and 10 (16.4 %) had a disciplinary record. In contrast, 99 (61.9 %) of the non-mentored students experienced lower or unchanged satisfaction of BPN between the assessment points (M age $= 12.07$, $SD = 1.85$) of whom 56 (56.5 %) were female, 61 (61.6 %) attended classes at the second level of basic education, 59 (59.6 %) had been indicated to attend supplementary classes, 45 (45.5 %) had been previously retained, 75 (75.8 %) had a record of absenteeism and 19 (19.2 %) had a disciplinary record.

The mentoring program: metodologia TUTAL

Metodologia TUTAL is an SBM program developed in Portugal by a consortium of public and private organizations under a grant from the European Social Fund (EQUAL Communitarian Initiative). The program defines SBM as a method of support and orientation provided by a more experienced individual (the mentor) for a child or adolescent (the mentee) for, at least, one school year (Alarcão and Simões 2008). An uncommon feature of this program is that the mentors are also the teachers of the mentees.

The mentees involved in *Metodologia TUTAL* are students referred to the program by the school boards because of low school attendance rates, an indication for supplementary classes, disciplinary problems and/or underachievement.

The mentors are teachers who volunteer to mentor their own students. Whenever the number of volunteer teachers fails to meet the needs of the program, the school boards

Table 2 Mentored and non-mentored students' demographic and individual risk characteristics for each of the conditions of satisfaction of BPN

	1 ($n = 88$)	2 ($n = 69$)	3 ($n = 61$)	4 ($n = 99$)
Gender–M (*F*)	35 (*53*)	32 (*37*)	35 (*26*)	43 (*56*)
Age–M (*SD*)	12.61 (*1.77*)	12.91 (*1.71*)	12.03 (*1.76*)	12.07 (*1.85*)
Educational level–second level (*third level*)	57 (*31*)	36 (*33*)	30 (*31*)	61 (*38*)
Risk factors				
Supplementary classes	73 (83.0 %)	58 (84.1 %)	42 (68.9 %)	59 (59.6 %)
Prior retentions	20 (22.7 %)	11 (15.9 %)	30 (49.2 %)	45 (45.5 %)
Absenteeism	26 (29.6 %)	53 (76.8 %)	41 (67.2 %)	75 (75.8 %)
Disciplinary record	27 (30.7 %)	49 (71.0 %)	10 (16.4 %)	19 (19.2 %)

1. Mentored students (increased satisfaction of BPN). 2. Mentored students (lower or unchanged satisfaction of BPN); 3. Non-mentored students (increased satisfaction of BPN); 4. Non-mentored students (lower or unchanged satisfaction of BPN)

invite other teachers to participate. Both the volunteer and invited teachers have to meet two selection criteria: (a) they must have had some experience in informal mentoring in school or in the community; and (b) preferably, they should be members of the permanent staff of their respective school.

The mentors are enrolled in a 16-h training program prior to the beginning of the official school year. The training includes: (a) basic information about SBM and the main features of *Metodologia TUTAL*; (b) practicing communication and motivational skills to work with the mentees; and (c) planning activities in the context of group and one-on-one mentoring sessions. Ongoing supervision of the program comprises monthly meetings and informal contact by phone and e-mail with a coordinator from a non-governmental organization responsible for promoting the program.

The mentoring activities occur in two formats. Weekly one-on-one mentoring meetings, which do not overlap with the mentees' classes, are scheduled. These sessions focus on the following: (a) supporting the mentees' competence needs, by offering help with academic-related tasks such as assisting with homework, teaching study methods, and preparing for tests; (b) supporting the mentees' relatedness needs by discussing personal matters such as stressful or positive relationships with peers and teachers and family issues emphasizing relational interest, empathy, authenticity and trust; (c) supporting the mentees' autonomy needs through the discussion or role-modeling of self-regulation strategies related to school attendance or classroom behavior or providing information related to important decisions, such as choosing future training or learning programs. One-on-one mentoring also includes informal activities, such as contacts outside the classroom or office encouraged by the mentor. Mentors are taught the importance of delivering balanced support to the different BPN. However, they are intentionally given the opportunity to regulate the amount of the support given the mentees during SBM sessions.

Ninety-minute weekly group mentoring sessions promoted by the mentors start at the beginning of the school-year; the sessions focus on the schoolwork orientation of the mentees and promote their social integration and the discussion of themes that were relevant to each group. The group mentoring sessions precede one-on-one sessions to facilitate mentor–mentee matching. One month later, the mentees and mentors start exploratory one-on-one discussions on their goals for the SBM relationship. These discussions adapt into a process of negotiation between the parties and pave the way for the dyadic mentoring relationships that are established two weeks later, according to shared goals and mutual interests. The combination of individual and group mentoring activities is intended to enhance the integration of SBM with the expected social behavior and learning performance of the mentees in the classroom.

Independent measures

SBM

The participants were characterized according to whether they were being mentored or not (0 = Yes; 1 = No).

Basic need satisfaction in relationships scale (BNSRS)

The Portuguese version of the BNSRS (Simões and Alarcão 2013) includes 9 items rated on a five-point Likert scale that ranges from 1 (*never*) to 5 (*always*). The possible scores range from 9 to 45 points. The scale comprises nine affirmative items (e.g. When I am with

him/her, I feel free to be who I am) covering issues of relatedness, competence and autonomy satisfaction; three of the items are reversed (e.g. When I am with him/her, I often feel inadequate or incompetent). The BNSRS assesses the satisfaction of BPN in any targeted relationship, with higher scores indicating greater satisfaction of BPN in a particular relationship. In this study, the BNSRS was used to calculate a whole score of the mentored and non-mentored students' appraisals of the level of BPN support offered by their school mentors or class directors. The option of rating relationships with class directors was given to the non-mentored students because this was their most relevant relationship with a teacher. The internal consistency of the BNSRS was adequate at both time point 2 ($\alpha = .79$) and time point 3 ($\alpha = .87$).

Dependent measures

Five dependent measures were considered in the analyses as indicators of school performance: Portuguese language grade, math grade, Grade Point Average (GPA), disciplinary referrals and unexcused absences. We chose these indicators because of increased recommendations that the academic impact of interventions for at-risk students must be described in terms of both school grades and academic-related behaviors (Schwartz et al. 2012). Moreover, these indicators are contextually relevant; the Portuguese educational system is still struggling with high levels of school underachievement, high rates of absenteeism and increasing levels of behavior problems (Conselho Nacional da Educação 2011).

We specifically characterized Portuguese language and math grades as indicators of school performance because grade promotion in the second and third levels of the Portuguese basic education system depends on having positive classifications in at least one of these subjects. We also included the GPA in order to have an indicator that could reflect the general academic performance of the participants. In the Portuguese basic education system, the grades for each subject range from 1 to 5. Levels 1 and 2 are poor grades, while levels 3–5 are good. We checked Portuguese language and math grades for each of the participants at each evaluation time point. In addition, we calculated the GPA for each of the participants. The GPA at each of the evaluation time points corresponded to the sum of all the grades, ranging from 1 to 5, divided by the total number of subjects attended by each participant.

The total numbers of discipline referrals and unexcused absences registered in the students' school record were counted. According to the Portuguese law, unexcused absences may vary from 0 to 31 or from 0 to 36, respectively, in the second level and third level of basic education. The numbers of disciplinary referrals and of unexcused absences were assessed only for time points 1 and 3. This option was made because disciplinary referrals and unexcused absences numbers for each student are rechecked and definite only by the end of each school year. Table 3 includes the descriptive statistics for the independent measure and the dependent measures.

Procedures

Information was gathered from each of the participants' school files. Before the data were collected, informed consent was obtained from the legal representatives of the students. Information about the targeted variables was gathered between March and September of 2011, through an examination of the personal file of each participant.

Table 3 Mentored and non-mentored students statistics for the independent measure and the dependent measures

Variables	Mentored students		Non-mentored students	
	M	*SD*	M	*SD*
Satisfaction of BPN (Time 2)	33.96	*6.64*	34.49	*7.18*
Satisfaction of BPN (Time 3)	34.40	*6.99*	32.95	*3.56*
Portuguese grade (Time 1)	2.74	*.67*	2.84	*.63*
Portuguese grade (Time 2)	2.91	*.54*	2.74	*.54*
Portuguese grade (Time 3)	2.95	*.57*	2.83	*.49*
Math grade (Time 1)	2.65	*.64*	2.69	*.60*
Math grade (Time 2)	2.79	*.59*	2.63	*.67*
Math grade (Time 3)	2.91	*.59*	2.80	*.68*
GPA (Time 1)	3.05	*.52*	3.19	*.50*
GPA (Time 2)	3.05	*.36*	2.94	*.39*
GPA (Time 3)	3.19	*.37*	3.05	*.36*
Disciplinary referrals (Time 1)	1.95	*8.13*	2.54	*9.42*
Disciplinary referrals (Time 3)	.79	*2.66*	1.12	*5.18*
Unexcused absences (Time 1)	13.11	*14.56*	11.11	*14.38*
Unexcused absences (Time 3)	12.69	*13.36*	16.07	*14.94*

Data analyses

Data analyses were conducted using the Statistical Package for Social Sciences (SPSS) v. 19.0. An exploratory analysis was performed to verify patterns of missing data and to test for a normal distribution of the original variables as well as to examine the equivalence between the participants' groups and subgroups. The missing data were random and limited (< 2.2 %) and were, therefore, handled with a simple group mean substitution. In general, the dependent variables assessed were moderately correlated with each other for each of the samples, as depicted in Tables 4 and 5. The normality of the variables was verified through the Kolmogorov–Smirnov test, with the Lilliefors correction, while the homogeneity of the variances was screened using the Levene test.

Two Multivariate Analysis of Covariance (MANCOVA) models including follow-up analysis of covariance (ANCOVA) were conducted to test hypotheses 1 and 2. This sort of statistical analysis was performed with the intention of reducing the risk of inflation from conducting separate analyses of variance for each of the dependent variables. The first MANCOVA included the number of unexcused absences and disciplinary referrals for time point 1 and time point 3 as within-subject variables, being mentored or not, as well as the satisfaction of BPN (time point 3) as between-subject factors, with age, prior retention, and the satisfaction of BPN (time point 2) as covariates. The second MANCOVA model was similarly set; however, Portuguese language grade, math grade and GPA for all the assessment points were included as within-subject variables.

Two additional MANCOVA and the respective follow-up ANCOVA were performed to assess hypotheses 3 through 8. The targeted dependent variables were again included in the model as within-subjects variables. A new factor was introduced to calculate the group differences between time points 2 and 3 in terms of the levels of BPN satisfaction. This factor was divided into four levels: mentored students with an increased satisfaction of

Table 4 Correlation analysis for Portuguese grades, math grades and GPA (time points 1, 2 and 3)

Variables	Correlations								
	1	2	3	4	5	6	7	8	9
1. Portuguese grade (Time 1)									
2. Portuguese grade (Time 2)	.11								
3. Portuguese grade (Time 3)	.07	.63**							
4. Math grade (Time 1)	.68**	.09	.11						
5. Math grade (Time 2)	.16**	.46**	.49**	.27**					
6. Math grade (Time 3)	.18**	.41**	.48**	.27**	.71**				
7. GPA (Time 1)	.81**	.09	.08	.72**	.15**	.20**			
8. GPA (Time 2)	.15**	.58**	.53**	.22**	.64**	.58**	.20**		
9. GPA (Time 3)	.12**	.48**	.66**	.22**	.54**	.66**	.20**	.74**	

* $p < .05$, ** $p < .01$

Table 5 Correlation analysis for disciplinary referrals, and unexcused absences (time points 1 and 3)

Variables	Correlations			
	1	2	3	4
1. Disciplinary referrals (Time 1)				
2. Disciplinary referrals (Time 3)	.59**			
3. Unexcused absences (Time 1)	.32**	.15**		
4. Unexcused absences (Time 3)	.23**	.13*	.61**	

* $p < .05$, ** $p < .01$

BPN; mentored students with a lower or unchanged satisfaction of BPN; non-mentored students with an increased satisfaction of BPN; and non-mentored students with a lower or unchanged satisfaction of BPN. Finally, age and prior retentions were included in the model as covariates. These additional MANCOVAs included post hoc tests for multiple comparisons of the observed means using Fisher's Least Significant Difference test. The effect sizes (ηp^2) were calculated for all MANCOVAs. The level of significance for the statistical tests was set at $p < .05$.

Results

The study of the equivalence between mentored and non-mentored groups revealed that the mentored students were significantly older than the non-mentored students, $t(1, 316) = 3.13$, $p = .002$, and had a greater chance of being previously retained, $\chi^2(1, 316) = 26.21$, $p = .000$.

A statistically significant MANCOVA was obtained for the independent effect of the type of group on the participants' grades, $F(1, 316) = 2.62$, $p = .05$. Follow-up ANCOVAs depicted significant differences between mentored and non-mentored students regarding Portuguese grade, $F(1,316) = 6.16$, $p = .01$, $\eta p^2 = .02$, and math grade, $F(1,316) = 5.31$, $p = .02$, $\eta p^2 = .02$, and a marginally significant effect for GPA, $F(1,316) = 1.09$, $p = .10$, $\eta p^2 = .01$, from time point 1 to time point 3. The independent

effect of the satisfaction of BPN was close to reaching statistical significance, $F(544, 1570) = 1.23$, $p = .06$. Follow-up ANCOVAs showed a marginally significant effect for math grade, $F(544, 1570) = 1.23$, $p = .06$, which was close to reaching statistical significance. However, the interaction between SBM and the satisfaction of BPN was not significant regarding the participants' grades.

A significant MANCOVA was also found for the independent effect of the type of group on the participants' numbers of disciplinary referrals and unexcused absences, $F(1, 316) = 4.68$, $p = .01$. The following ANCOVAs revealed that the mentored students had a significantly lower number of unexcused absences, $F(1, 316) = 8.54$, $p = .004$, $\eta p^2 = .03$. Conversely, significant effects for both the satisfaction of BPN and the interaction of the type of group with the satisfaction of BPN were not found for the participants' numbers of disciplinary referrals and unexcused absences. As a result, hypothesis 1 is largely supported by data, in contrast to hypothesis 2.

Significant MANCOVA effects were observed regarding the participants' grades as well, $F(3, 314) = 2.13$, $p = .03$. The follow-up ANCOVAs for both MANCOVAs were statistically significant for Portuguese grade, $F(3,314) = 3.57$, $p = .02$ $\eta p^2 = .03$, math grade, $F(3,314) = 2.35$, $p = .07$, $\eta p^2 = .02$, and GPA, $F(3,314) = 389$, $p = .03$, $\eta p^2 = .03$. Significant MANCOVA effects were also obtained regarding the effects of opposite levels of satisfaction of BPN in the two groups on the participants' numbers of disciplinary referrals and unexcused absences, $F(3, 314) = 4.57$, $p = .000$.

Subsequent post hoc mean comparisons obtained from both MANCOVAs are presented in Table 6. Such comparisons reveal that the mentees who felt increased support for their BPN exhibited significantly or marginally significantly higher ratings between the first and third assessment points for Portuguese grade ($p < .05$), math grade ($p < .05$), GPA ($p < .10$) and unexcused absences, ($p < .001$) than did the non-mentored students who also experienced an increase in the satisfaction of BPN. Thus, hypothesis 3 was largely supported by the evidences. Moreover, the mentees who perceived increased support of BPN had significantly higher Portuguese grades ($p < .05$) as well as a significantly lower number of unexcused absences ($p < .05$) than non-mentored students who perceived lower or unchanged support for their BPN. Therefore, hypothesis 4 was supported only in part by the results. Conversely, the mentees who perceived increased support for their BPN denoted a marginally significantly lower mean GPA ($p < .10$) and marginally significantly higher mean number of unexcused absences ($p < .10$) than those mentees in the reverse condition, meaning that these results are not consistent with hypothesis 5. In addition, the non-mentored students that felt increasingly supported in their BPN between the assessment points did not differ significantly from non-mentored students in the opposite condition of BPN satisfaction, which does not support hypothesis 6. Moreover, the post hoc mean comparisons revealed that mentees who experienced lower or unchanged support of BPN had marginally significantly higher Portuguese grades ($p < .10$), a significantly higher GPA ($p < .05$) and a significantly lower number of unexcused absences ($p < .001$) between the first and third assessment points than non-mentored students in an identical condition of BPN support, thus contradicting hypothesis 7. However, the non-mentored students with less or similar satisfaction of their BPN had a significantly higher GPA ($p < .05$) and significantly lower mean number of unexcused absences ($p < .001$) than the mentees in the opposite condition, which is consistent, in part, with hypothesis 8.

In conclusion, the results indicate that SBM helped to improve school performance in general, especially for specific subjects, and to lower the number of unexcused absences, while BPN satisfaction alone was insufficient to promote better academic and behavior-related outcomes. More positive perceptions of BPN satisfaction between the assessment

Table 6 Post-hoc comparisons of the conditions of increased, decreased or unchanged support of the BPN of Mentored Students (MS) and Non-Mentored Students (NMS) in Terms of the Dependent Variables (Least Significant Difference [LSD] Test)

Dependent measures	Mean difference (95 % confidence interval)					
	1	2	3	4	5	6
Portuguese grade	.18 (.05, .31)*	.12 (−.01, .22)*	.000 (−.12, .12)	−.06 (−.18, −.07)	.12 (−.01, .24)†	.12 (−.02, .25)
Math grade	. 16 (−.01, .33)*	.07 (−.08, .21)	−.06 (−.20, .11)	−.10 (−.25, .06)	.13 (−.03, .28)	.10 (.06, .25)
GPA	.09 (−.01, .18)†	.04 (−.05, .12)	−.09 (−.19, −.01)†	−.02 (−.11, .07)	.12 (.03, .22)*	.12 (.03, .22)*
Disciplinary referrals	.93 (−2.63, .76)	−1.00 (−2.55, .59)	.93 (−.26, .75)	−.45 (−2.16, 1.26)	−1.94 (−3.51, −.22)	−1.48 (−3.39, .42)
Unexcused absences	−4.78 (−7.68, −1.89)***	−2.57 (−5.14, −01)*	2.52 (−.22, 5.27)†	2.21 (−4.98, .55)	−5.09 (−7.87, 2.51)***	−7.31 (−10.39, −4.53)***

† $p < .10$, * $p < .05$; *** $p < .001$

1. MS (increased satisfaction of BPN) x NMS (increased satisfaction of BPN); 2. MS (increased satisfaction of BPN) x NMS (lower or unchanged satisfaction of BPN); 3. MS (increased satisfaction of BPN) x MS (lower or unchanged satisfaction of BPN); 4. NMS (lower satisfaction of BPN) x NMS (increased satisfaction of BPN); 5. NMS (lower or unchanged satisfaction of BPN) x MS (lower satisfaction of BPN); 6. MS (lower or unchanged satisfaction of BPN) x NMS (increased satisfaction of BPN)

points generally led to significantly better results in the different dependent variables. However, mentored students who considered themselves increasingly supported by their mentors did not show better results in the different dependent variables compared to non-mentored students with opposite levels of BPN satisfaction. These results are discussed in-depth in the following section.

Discussion

Our work led to two major findings. First, SBM delivered by teachers in *Metodologia TUTAL* was effective in improving the overall school performance of mentored students compared to equivalent non-mentored students. SBM was associated with grade improvements in specific subjects such as Portuguese language and math, but the analyses also showed an association of SBM with better GPA which was marginally significant. Moreover, SBM was associated with a significant decrease in the mentored students' numbers of unexcused absences between time points 1 and 3, compared to non-mentored students.

The effectiveness of *Metodologia TUTAL* builds on previous evidences demonstrating that SBM is useful in improving the mentees' school grades (Converse and Lingnugaris/Kraft 2009; Herrera et al. 2011; Portwood et al. 2005) and in reducing the number of unexcused absences (Converse and Lingnugaris/Kraft 2009). However, while mentors in other programs are usually volunteer adults external to the schools' staffs, the most unique feature of *Metodologia TUTAL* is that the mentors were also teachers of their mentees. This arrangement could represent a barrier to the proper fulfillment of the mentored students' entire range of needs by thwarting the necessary informality upon which these relationships rely (Goldner and Mayseless 2008). Nevertheless, this same feature of *Metodologia TUTAL* may have played a determinant role in the improvement of mentored students' achievement and in the reduction of unexcused absences. The combination of mentoring and teaching roles may have started by influencing the focus of mentoring relationships. The mentors were probably more aware of the mentees' school requirements and better able to mobilize additional efforts to accomplish academic goals. In turn, a more regular focus on the mentees' competence needs may have influenced SBM activities. It is reasonable to assume that the mentors and mentees met to discuss and work primarily on learning and behavior issues (Schwartz et al. 2012). Consequently, the focus on school performance issues may have influenced the relationship style: mentors were likely involved in helping the mentees to overcome previous learning flaws (Deutsch and Spencer 2009; Karcher and Nakkula 2010). This finding further sustains the interpretation that adults experienced in caring and educational roles are in a privileged position to mentor (DuBois et al. 2002; Rhodes et al. 2006). The effectiveness of teachers as mentors may be also explained by the fact that the teachers' support has been increasingly detailed as being more valuable than the support of parents and friends in the lives of adolescents (Chu et al. 2010).

Our second major finding is that the satisfaction of BPN in general was not associated with mentored students' improvements between time point 1 and time point 3 in comparison to non-mentored students in most of the targeted variables. However, further analyses show that the level of BPN satisfaction affected the differences between mentored and non-mentored students regarding school performance indicators. Mentored students that felt increasingly supported in their BPN between time points 2 and 3 had significantly or marginally significantly better outcomes in the selected variables than non-mentored

students in an identical condition of BPN satisfaction across the assessment points. In their turn, mentored students that experienced less or similar satisfaction of BPN only showed significantly better outcomes on GPA as well as a significantly lower number of unexcused absences for the same time period than non-mentored students that also felt less or similarly supported in their BPN between time points 2 and 3. Unexpectedly, the conditions of increased satisfaction of BPN did not show a systematic improvement in the different dependent measures between the assessment points compared to the conditions of less or unchanged support of BPN.

The findings related to the differential effects of the perceived satisfaction of BPN sustain the idea that the quality of SBM relationships facilitates better school performance, but only to a certain extent (DuBois and Silverthorn 2005). More importantly, however, these same findings seem to reveal that an uneven satisfaction of BPN may have played a significant part in explaining the most unexpected results in this study (Milyavskaya et al. 2009). Some factors possibly led to an unbalanced satisfaction of BPN in *Metodologia TUTAL*. First, the singularities of this specific SBM program, namely the mentors' autonomy to determine the necessary focuses and amount of mentoring delivered to each mentee (blind for review), as well as the fact that these particular mentors also instructed and evaluated their mentees, probably affected the mentored students' perceptions of BPN satisfaction.

Second, the satisfaction of BPN in SBM relationships may have been influenced by the mentees' level of relational risk. Some of the mentees that had better school performance indicators, while rating worse on the evolution of their perceived satisfaction of BPN, may have felt sufficiently supported by other adults in their lives. In other words, these mentees did not depend heavily on the mentors' support for their BPN. Conversely, other mentees that did not experience fulfilling relationships with adults in their lives may have found it more difficult to engage with mentors and, therefore, to acknowledge a positive evolution of the levels of satisfaction of BPN in SBM relationships. Previous findings in the SBM field confirm the impact of the mentees' relational profile on SBM outcomes: mentees that had either strongly positive or strongly negative relationships with adults prior to mentoring involvement had worse perceptions of academic competence than those mentees that had satisfactory, but not particularly strong relationships with other adults prior to SBM (Schwartz et al. 2011).

Finally, we believe that the unbalanced support of the mentees' BPN across the relationships held by the mentees with different teachers may have been another pertinent factor explaining the inconsistent associations between the opposite conditions of satisfaction of BPN in SBM and the results in the targeted dependent variables. Our interpretation is based on the fact that while mentored students that felt increased satisfaction of BPN improved their grades in specific subjects such as Portuguese and math compared to non-mentored students in identical or opposite conditions, mentored students who perceived lower or similar satisfaction of BPN were more successful in improving their general academic performance measured by their GPA than all the remaining subgroups regarding BPN satisfaction. These results may indicate that teachers that were not in the role of mentors did not systematically address the mentees' BPN or that their level of commitment to SBM goals was not uniform, ultimately affecting mentored students' school performance. Self-Determination Theory-based research further grounds our interpretation: a balanced support of BPN is relevant not only within relationships, but also across different relationships within the same context in order to deliver better school-related outcomes (Milyavskaya et al. 2009). Moreover, children and adolescents, particularly the most vulnerable ones, seem to be more dependent on a balanced support of BPN

in various relationships due to their developmental requirements (Véroneau et al. 2004). Finally, our interpretation is supported by the opinions of the mentors and mentees' parents concerning this specific SBM program; both acknowledged that some teachers were more committed with the goals of the program than others (Simões and Alarcão, submitted). Therefore, the organization of the program possibly overlooked the involvement of different significant adults in the realization of SBM goals. The importance for an appropriate collaboration between significant adults in the lives of the mentees, in order to promote school achievement is also underlined in the literature (Goldner and Mayseless 2008; Chan et al. 2013) further suggesting that this fact may have determined the academic-related outcomes of the mentees in *Metodologia TUTAL*.

Implications and limitations

This study has practical and research implications and limitations. The most important practical implication of this work is to further demonstrate that teachers may be effective mentors (DuBois et al. 2002). However, the combination of mentoring and teaching may lead to an interpretation of SBM as an opportunity to overcome learning problems. This means that mentors that are also instructors of the mentees may find it hard to combine the necessary asymmetrical and symmetrical interactions that represent a central feature of SBM relationships (Goldner and Mayseless 2008). As a result, agencies and schools must work to shape SBM goals to the needs of each mentee (Karcher and Nakkula 2010) and to empower mentors in managing the focus and amount of mentoring, according to the mentees' accumulation of risk and a solid training program. In addition, a better integration of SBM goals is required in school and among teachers in order to improve this program's effectiveness in delivering a better school performance, so that a balanced support of the mentored students' BPN is delivered within SBM and across the different relationships with other teachers.

From a research point of view, we consider that new approaches to the impact of the satisfaction of BPN on SBM are required. On the one hand, besides assessing the influence of the whole amount of satisfaction of BPN on the mentored students' grades and school-related behaviors, it would be relevant to study the impact of the satisfaction of each of the BPN separately. Although BPN are usually associated with each other in natural contexts (Bartholomew et al. 2011), this sort of approach would more properly depict the mentors' relational style as a prescriptive or developmental one along with its respective effects. On the other hand, the analysis of the amount of support of BPN delivered by mentors may not be sufficient to fully capture the complex relational process of mentoring. In fact, the mentees may feel more supported in their needs, but that does not ultimately mean that they may become intrinsically motivated to accomplish a better school performance. Therefore, further analyses are needed in order to include the amount of support given to BPN in SBM, but also the qualitative description of the motivational processes underlying SBM relationships such as the mentees' perceived locus of control or sense of autonomy when they study and learn (Vansteenkiste et al. 2009). These models of analysis, using appropriate statistical techniques, such as path analysis, as well as adequate sampling procedures, such as proportionate random sampling, may help to increasingly define the pathways of influence of BPN in the mentored students' school performance. Finally, these results are important in the context of SBM delivered by teachers, but its generalization is limited, mostly due to the variability in SBM program designs (DuBois et al. 2011).

Conclusion

The present study demonstrates that the combination of mentoring and teaching roles is effective in reducing the mentees' unexcused absences and in improving the grades in specific subjects as well as the overall school achievement. Our findings underline that an increased satisfaction of BPN may be an important ingredient in the quality of SBM relationships, although it may fall short as a source of influence on the mentored students' school performance. A more balanced support of BPN in SBM relationships and across the different relationships held by the mentees with other teachers may be decisive for encouraging the improvement of school performance.

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