Principal support for student psychological needs
A social-psychological pathway to a healthy learning environment

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Abstract

Purpose – Although leadership evidence highlights the importance of cooperative principal-teacher relationships, research has not looked thoroughly at the content behind principal-teacher interactions. The purpose of this paper is to use self-determination theory and organizational conversation to develop principal support for student psychological needs (PSSPN), a concept that represents principal-teacher interactions based on social and psychological factors contributing to student learning. The empirical part of the study tests the relationship between PSSPN and faculty trust in students and student self-regulated learning.

Design/methodology/approach – Hypotheses were tested with a non-experimental, correlational research design using *ex post facto* data. Data were collected from 3,339 students and 633 teachers in 71 schools located in a metropolitan area of a southwestern city in the USA. Hypotheses were tested with a 2-2-1 multi-level mediation model in HLM 7.0 with restricted maximum likelihood estimation.

Findings – Principal support for student psychological needs had a positive and statistically significant relationship with faculty trust in students and self-regulated learning. Additionally faculty trust mediated the relationship between principal support for student psychological needs and self-regulated learning.

Originality/value – This is one of the first studies to examine school leadership by the content that is exchanged during principal-teacher interactions. Principal support for student psychological needs establishes a theoretically-based framework to study leadership conversations and to guide administrative practices. Empirical results offer encouraging evidence that the simple act of framing interactions around the science of wellbeing can be an effective resource for school principals.

Keywords Self-regulation, Self-determination theory, Faculty trust, Leadership conversation

Paper type Research paper

In healthcare, and more recently in education, research evidence shows that relatively small and seemingly insignificant changes to processes and practices are producing profound improvements in outcomes that have eluded more expensive and comprehensive interventions (Berwick, 2008; Kenthirarajah and Walton, 2015; Yeager and Walton, 2011). For instance, Haynes *et al.* (2009) found that using a pre-operation checklist significantly reduced surgical complications and deaths in over 3,000 patients in eight hospitals. A few examples in school settings include using critical feedback that affirms students' ability to achieve high standards (Yeager *et al.*, 2014), a 15-20-minute reflective writing exercise on personal values (Cohen *et al.*, 2009), and teaching students about the brain and how it grows like a muscle (Blackwell *et al.*, 2007).

The above research has been referred to as social-psychological interventions (Kenthirarajah and Walton, 2015). In schools, interventions have been integrated into daily routines to study how small adjustments to adult-student interactions affect school experiences. Treatments expose students to information designed to disrupt mindsets behind maladaptive behavior, such as disengagement from learning and social isolation (Yeager and Walton, 2011; Yeager *et al.*, 2013). Existing evidence suggests that the content of information can spark positive behavioral changes that may alter students' life trajectory (Blackwell *et al.*, 2007; Kenthirarajah and Walton, 2015; Walton and Cohen, 2007, 2011).

Useful knowledge can result from extending aspects of social-psychological research to school administration. School principals, through their numerous formal and informal interactions, have considerable influence over learning experiences and opportunities (Leithwood *et al.*, 2010; Lortie, 2009; Louis *et al.*, 2010). Principal-teacher interactions in particular have persuasive power in shaping teacher mindsets and guiding teacher behavior (Lowenhaupt, 2014). The problem is that research has overlooked this topic. Most leadership studies examine leadership tasks, responsibilities, and processes, neglecting the substance of leadership conversations (Lowenhaupt, 2014). Lowenhaupt (2014) said it best, "language is not simply an accessory or aid to practice, but a core and defining component of leadership" (p. 447).

In this study, self-determination theory is used to identify the social and psychological determinants of student motivation, growth, and well-being. This evidence, along with Groysberg and Slind's (2012) work on organizational conversation, is used to develop principal support for student psychological needs (PSSPN), a concept that represents principal-teacher interactions based on social and psychological factors behind optimal student learning. The empirical part of the study tests the relationship between PSSPN and features of a healthy learning environment.

PSSPN: its foundation and meaning

Unlike many current leadership theories (e.g. instructional, transformation, shared, collective, etc.), PSSPN does not explain how school leaders carry out their respective responsibilities. Instead, it delves into the nature of principal-teacher social exchanges, advancing elements of conversations that have consequences for developing learning environments conducive to growth producing experiences. Two theoretical and conceptual frameworks underpin the conceptualization: self-determination theory and organizational conversation.

Self-determination theory assumes that human growth and development follow an integrative process whereby features of the social world interact with innate biological tendencies in a way that can ignite healthy development and well-being, or conversely, can undermine innate ability (Deci and Ryan, 2016; Ryan and Deci, 2002). Often, the difference between children who adapt to school routines and students who struggle to integrate school with their sense of self comes down to schools and classrooms experienced as supporting the psychological needs of autonomy, competence, and relatedness (Niemiec and Ryan, 2009; Reeve, 2002). These three psychological needs function as regulatory mechanisms for positive adjustment and personal well-being (Deci and Ryan, 2016).

Just as calories supply the body with energy needed to perform physical activities, autonomy, competence, and relatedness supply the energy behind autonomous motivation (Adams *et al.*, 2016; Niemiec and Ryan, 2009; Ryan and Deci, 2000). Autonomy manifests as a cognitive belief representing individual agency and control over academic goals (Assor *et al.*, 2002; Jang *et al.*, 2010). Competence is defined as possessing the knowledge of how to master a subject or activity and the confidence to apply that knowledge to achieve desired goals (Connell and Wellborn, 1991). Relatedness includes feelings of security, attachment, and belonging to educators and the school (Ryan and Deci, 2002).

The function of schools, similar to that of families or other social systems, is to activate needs through supportive conditions and processes. Support for psychological needs, however, does not come naturally to many schools (Adams *et al.*, 2015, 2016; Reeve *et al.*, 2004). Traditional structures, routines, and regularities gravitate toward the controlling end of the spectrum. This controlling disposition has calcified in many places under the high stakes nature of test-based accountability (Deci and Ryan, 2016; Ryan and Weinstein, 2009). Creating a need-supportive climate requires constant tending and care by school principals (Murphy and Torre, 2014; Lortie, 2009).

Groysberg and Slind's (2012) organizational conversation framework explains how leadership interactions can result in a need-supporting learning environment. They argue that conversation is a complex process that involves more than merely communicating with employees. Conversation entails intentionality. Intentionality structures interactions in a way that enables transmitters and receivers of messages to generate meaning from the information that is communicated (Groysberg and Slind, 2012). In many respects, intentionality functions as an organizational simplification system. Simplification systems are mental models used by organizational actors to filter information through conceptual cues that aid meaning-making and purposeful action (Honig and Hatch, 2004). Applying the lens of intentionality to PSSPN indicates that knowledge about student growth, development, and well-being form as principals and teachers engage in purposeful conversations about student psychological needs and need-supporting conditions.

Informed by self-determination theory and organizational conversation, PSSPN is defined as intentional engagement of teachers in conversations centered on supporting student autonomy, competence, and relatedness in the classroom. Conversations span the spectrum from formal interactions that take place in the context of teacher evaluation to informal exchanges that may happen during a classroom visit, during a hallway chat, or even via e-mail. PSSPN is not concerned with the expression of language through inflection, tone, and frequency of words used. Instead, it aims to account for a specific type of information communicated by principals and received by teachers. PSSPN resides in the content of information exchanged with teachers.

Criteria for need-supporting conversations come from evidence on teaching practices found to stimulate student engagement, autonomous motivation, and deep learning. Several empirical studies using self-determination theory have advanced a general set of teaching behaviors and classroom routines that support student psychological needs. These general practices informed our operationalization of PSSPN.

Autonomy support is more likely to be experienced when teachers use informational language, explain the value and rationale for academic tasks, accept and respect student opinions and negative expressions, and minimize the salience of external control and coercion (Jang *et al.*, 2010; Reeve, 2002). Thus, principal-teacher conversations structured around autonomy support would de-emphasize evaluating and controlling practices while stressing the relevance and meaningfulness of learning tasks, affording voice and choice in activities, and framing goals that have intrinsic value and purpose (Assor *et al.*, 2002; Niemiec and Ryan, 2009).

Student competence flourishes when teachers introduce optimally challenging learning activities, provide regular and open performance feedback, and structure academic tasks so that students can expand their knowledge and capabilities (Niemiec and Ryan, 2009; Reeve, 2002; Reeve and Jang, 2006). Thus, principal-teacher conversations addressing competence support would center on how teachers communicate high expectations for students, how they use performance information and feedback in non-controlling ways, and how they build student confidence with optimally challenging tasks (Reeve and Halusic, 2009). Relatedness exists as a feeling of attachment and belonging to others, as well as security in a specific context (Ryan and Deci, 2000, 2002). Relational-supportive conversations would address the social adjustment of students, respect and acceptance of students, and open communication with parents/guardians (Deci and Ryan, 2016).

Rationale and hypotheses
Social-psychological interventions investigate how environmental and humanistic forces interact to affect individual and group mindsets, behavior, and accomplishments (Kenthirarajah and Walton, 2015). PSSPN is not introduced in this study as an external leadership intervention; instead, theory and evidence are used to advance hypotheses about

the plausible connection between principal-teacher interactions centered on student psychological needs and a healthy learning environment as observed in faculty trust in students and student self-regulated learning.

PSSPN and faculty trust in students

Faculty trust in students is an essential fabric of an instructional climate that can activate student's inner motivation to put forth their best effort in school (Adams and Forsyth, 2013). Trust enables teachers to risk vulnerability knowing that students are competent, benevolent, honest, open, and reliable (Tschannen-Moran, 2014). Without trust, teachers are disposed to control student behavior with external mechanisms that reliably undermine motivation, but with it they are able to engage students in co-constructing knowledge and meaning from instructional experiences (Adams *et al.*, 2016; Tschannen-Moran, 2014).

Only limited evidence exists on the formation of faculty trust in students. Normative student behavior shapes teacher trust (Forsyth *et al.*, 2011), but we have reason to believe that information about the science of motivation can be communicated in ways that sway teachers' explanations of students' performance. Teacher trust would seem to grow if principal-teacher social exchanges evoke beliefs that students act benevolently, competently, openly, honestly, and reliably. Information leading to negative discernments of students would likely lessen trust beliefs by raising questions about students' intentions and their future actions (Bryk and Schneider, 2002).

Conversation theory provides an explanation for how PSSPN enables teachers to construct a representation of student behavior that elicits trust beliefs. On the surface, conversation can be viewed as the simple exchange of information between or among individuals. The reality, however, is quite different. Conversation represents a social-linguistic process of becoming informed about a specific phenomenon (Pask, 1976). Being informed requires thoughts and ideas to be cognitively processed through a common externality, such as shared definitions of terms, conceptual maps, simplification systems, or other ways of structuring knowledge (Scott, 2001). Interactions spread information and ideas, but a shared externality by which to examine information gives life to meaning and understanding. Without a common language or framework there is no way to make sense of information that is being communicated (Pask, 1975). At base, becoming informed depends on the exchange of information filtered through a common externality.

Consistent with conversation theory, PSSPN is based on leadership as being a conversation with teachers. PSSPN establishes an externality that structures principal-teacher interactions around the basic psychological needs dimension of self-determination theory. Additionally, it involves teachers and principals making sense of the root factors behind students' performance. Once established, PSSPN has the potential to change the way teachers understand factors behind student actions. For instance, student behaviors detrimental to faculty trust may over time get recast as symptoms of underlining issues addressable by school members. Conversations about need-support can redirect negative perceptions away from students and toward deficiencies in the system that undermine the student potential. Trust may not diminish if problems become interpreted as a lack of need-support, as opposed to low student interest or desire. This leads to the hypothesis:

H1. Teacher perceptions of PSSPN will be positively related to faculty trust in students.

PSSPN and student self-regulation

Self-regulated students are metacognitively, motivationally, and behaviorally active learners (Zimmerman, 1990). They act volitionally toward academic goals and possess the inner agency to control academic efforts (Reeve *et al.*, 2008). Self-regulation underpins internal motivation, course performance, achievement, and educational attainment (Cleary and Chen, 2009;

Zimmerman and Schunk, 2008). Classrooms and schools are generally better places to teach and learn when students demonstrate a willingness to learn for its internalized instrumental value (Reeve *et al.*, 2008). Schools play a part in the formation of self-regulation. Affording student choice, setting high expectations and standards, and establishing clear and open communication promote greater internal control over academically minded behavior in and outside of classrooms (Van Grinsven and Tillema, 2006).

A growth-oriented environment suitable for student self-regulation teeters on the disposition and actions of leaders (Deci and Ryan, 2016; Pelletier and Sharp, 2009). The social contagion of motivational dispositions offers an explanation for how PSSPN reaches students. The connection depends on the implicit transfer of beliefs and behaviors held by one person (or group) to another person (or group). Motivational orientations travel by way of an expectancy function whereby judgments of another party's motivation elicits expectations of appropriate task engagement (Wild and Enzle, 2002). This expectancy process results in beliefs and actions that resemble the orientations of another party. Social contagion has been observed in students who take-on the motivational beliefs of teachers, in third parties who judge the actions of a remote person and form similar beliefs and behavior, and in teachers whose instructional styles reflect the controlling practices of administrators (Flink *et al.*, 1990; Taylor and Ntoumanis, 2007).

Principal-teacher interactions form a conduit for social contagion of motivational beliefs and styles. Principals who lead with PSSPN in mind are more likely to advocate for, and to exhibit in their own behavior, a motivational style consistent with internal regulation. In such an environment, teachers are expected to gravitate toward a need-supporting instructional approach with students in their classrooms, establishing conditions for self-regulated learning to grow (Deci and Ryan, 2016). Thus, we hypothesize:

> *H2.* Teacher-perceived PSSPN will be positively related to student-perceived self-regulated learning.

As alluded to in the above rationale, the path connecting PSSPN to self-regulated learning travels through teachers. Teachers organize learning in ways that nurture or thwart autonomous regulation (Niemiec and Ryan, 2009). Although we do not measure instructional processes of teachers in this study, we do believe that faculty trust in students is a pre-condition for an instructional climate conducive to self-regulated learning.

Strong and stable faculty trust in students represents a controllable teaching condition that has consequences for student outcomes (Forsyth *et al.*, 2011; Goddard *et al.*, 2009). A faculty that perceives students as trustworthy is able to teach in ways that shift responsibility and control over learning from the teacher to students (Adams *et al.*, 2015). In other words, faculty trust in students provides fertile ground for need-supporting instructional practices that captivate the student interest and internal motivation (Adams *et al.*, 2016). Need-supporting environments underlie self-directed and self-regulated learning (Assor *et al.*, 2002; Deci and Ryan, 2016; Reeve *et al.*, 2004; Ryan and Deci, 2000). This leads to the hypothesis:

> *H3.* Teacher-perceived PSSPN will have an indirect effect on self-regulated learning through faculty trust in students.

Method
Hypotheses were tested with a non-experimental, correlational research design using *ex post facto* data. The purpose was to test relationships among PSSPN, student self-regulated learning, and faculty trust in students in the natural school setting. Being non-experimental, confounding factors associated with student and school demographics were controlled for in the statistical models.

Data source
Data come from 3,339 students and 633 teachers in 71 schools located in a metropolitan area of a southwestern city in the USA. For the analyses, 3,171 usable student cases and 601 usable teacher cases were analyzed. Schools in the sample are representative of a population of city schools in the USA that serve a majority-minority population with a large percentage of students qualifying for federal lunch subsidies. City schools in the USA serve approximately 7.2 million students with 71 percent of the students qualifying for federal lunch subsidies, 40 percent identifying as Hispanic, 29 percent as African-American, 19 percent as Caucasian, 8 percent as Asian/Pacific Islander, and 1 percent Native/Alaskan American (Council of the Great City Schools, 2016). Of the students in the sample, 77 percent qualified for the federal lunch program and 73 percent identified as non-Caucasian. For schools, the average free/reduced lunch (FRL) rate was 84 percent, and the average non-Caucasian rate was 64 percent.

Measures
PSSPN. The PSSPN Scale was developed to capture interactions around competence support, autonomy support, and relational support. The scale consists of nine Likert items with a response set ranging from 1 (strongly disagree) to 6 (strongly agree). Items for autonomy support include: "my principal asks me about how I make course content relevant;" "my principal wants to know how I make my class personally meaningful;" and "my principal wants to know what steps I take to motivate those learners who appear disengaged." Items for competence support include: "my principal want to know how I convey realistic but high expectations to learners;" "my principal asks how I help discouraged students build their confidence;" and "my principal asks to see how I use information about individual students to improve my teaching." Items for relatedness support include: "my principal consults with me about the social adjustment of individual students;" "my principal asks how I convey acceptance and respect to students, especially those who appear disengaged;" and "my principal asks about my contact with parents/guardians of students, regardless of their academic and social standing in class."

For a previous study we ran an exploratory factor analysis with principal axis extraction which was to examine the structural relationship among the items. One factor was extracted with an eigenvalue greater than 1. This factor explained 85 percent of the variance. Factor loadings ranged from 0.80 to 0.95. Inter-item consistency was strong with a Cronbach's α of 0.98. We conducted a confirmatory factor analysis with data from this study to further assess the structural relationships among the items (Figure A1). Consistent with EFA results, the nine items converge on one latent factor. All factor loadings exceed 0.70 and the specified model demonstrated good fit. χ^2 was statistically significant but CFI, TLI, and RMSEA were all in the acceptable range.

Self-regulated learning was measured with items taking from the Academic Self-Regulation Questionnaire (Ryan and Connell, 1989). The questionnaire uses 17 items to measure four regulatory types: external, introjected, identification, and integration. Given our interest in internal regulation, only items that measured identified and integrated regulation were used. These items represent behavior that originates with and is controlled by the student. The scale consisted of six items with a four-point Likert response set ranging from never (coded as 1) to always (coded as 4). Sample items include: "I do my classwork because I want to learn new things;" "I try to do well in school because I like doing a good job on my work;" "I do my homework because I want to understand the subject." Results of an exploratory factor analysis with data from our sample report factor loadings ranging from 0.73 to 0.89 and strong item reliability with an α of 0.87.

Faculty trust in students was measured with all five items from the Omnibus Trust Scale that measure teacher trust in students (Tschannen-Moran, 2004). The items parallel the theoretical properties of trust in that each operationalizes teacher shared perceptions of the openness, honesty, benevolence, reliability, and competence of students. Items used a six-point Likert response set ranging from strongly disagree to strongly agree. An exploratory factor analysis with data from this study reports that the five items cohere around one factor that explained over 60 percent of the variance. Factor loadings were good, ranging from 0.77 to 0.86. Item consistence was strong as reported by a Cronbach's α of 0.91. Sample items include: "Students in this school can be counted on to do their work;" "Teachers believe students in this school are competent learners;" "Teachers in this school trust their students."

Transformational leadership behavior. Transformational leadership behavior was used as a control variable in the models. Seven items from Bass' (1985) transformational leadership scale were used. These seven items were selected because they measure each of the seven facets of transformational leadership behavior. Psychometric tests of the seven items with data from this study report very good structural validity with one factor explaining over 77 percent of the variance in the items and factor loadings on this one factor ranging from 0.73 to 0.93. Internal item consistency as estimated with a Cronbach's α of 0.95 was also strong (Table AI). Items had a Likert response set ranging from 1 (strongly disagree) to 6 (strongly agree). Sample items include: "The principal at this school inspires others with his/her plans for the future;" "The principal at this school provides a good model for me to follow;" "The principal at this school develops a team attitude and spirit among employees."

School composition. The FRL rate was used as a proxy for student poverty. FRL reports the percentage of students in the school that qualify for the federal lunch subsidy. The percent of students in a school identifying as non-Caucasian was used to capture student demographics of the schools.

It is worth noting that a Harmon single factor test was used for faculty trust in students and PSSPN to ensure that common measurement bias was not a problem. These items appear on the same faculty survey. Results showed that two factors emerged from the extraction with eigenvalues over 1. All items for trust loaded strongest on the trust factor and all items for PSSPN loaded strongest on the PSSPN factor. Results can be obtained by contacting the author.

Analysis
Due to the hierarchical structure of the data, hypotheses were tested in HLM 7.0 with restricted maximum likelihood estimation. The first step was to decompose variance in the primary variables with an unconditional random effects ANOVA. Variance components from the unconditional model were used to estimate intraclass correlation (ICC) coefficients for the primary variables.

Unconditional random effects ANOVA:

$$\text{Level 1: } \text{SRL}_{ij} = \beta_{0j} + r_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + u_{0j}$$

The second step was to test a random intercepts means-as-outcomes model with faculty trust in students set as the dependent variable. Estimates for this model were used to measure the strength of the relationship between PSSPN and faculty trust in students. Transformational leadership was added as a control variable to test the comparative effects of PSSPN against a general type of leadership behavior associated with positive school change. School average faculty trust in students (β_{0j}) was predicted to be a function of the

grand mean (γ_{00}), the effect of school FRL rate(γ_{01}), percent non-Caucasian (γ_{02}), transformational leadership(γ_{03}), PSSPN (γ_{03}), and school-level error (u_{0j}). All school variables were grand-mean centered.

Random intercepts means-as-outcomes:

$$\text{Level 1: } \text{FTS}_{ij} = \beta_{0j} + r_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{ZFRL}_j) + \gamma_{02}(\text{Znon} - \text{percent Caucasian}_{ij})$$

$$+ \gamma_{03}(\text{ZTLB}_j) + \gamma_{04}(\text{ZPSSPN}_j) + u_{0j}$$

The third step was to test a random intercepts means-as-outcomes model with self-regulated learning as the dependent variable and school FRL rate, percent non-Caucasian, and transformational leadership as school-level control variables. All school variables were grand-mean centered. In this model, school average self-regulated learning (β_{0j}) was predicted to be a function of the grand mean (γ_{00}), the effect of school FRL rate (γ_{01}), percent non-Caucasian (γ_{02}), transformational leadership (γ_{03}), PSSPN (γ_{03}), and school-level error (u_{0j}).

Random intercepts means-as-outcomes:

$$\text{Level 1: } \text{SRL}_{ij} = \beta_{0j} + r_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{ZFRL}_j) + \gamma_{02}(\text{Zpercent non} - \text{Caucasian}_{ij}) + \gamma_{03}(\text{ZTLB}_j)$$

$$+ \gamma_{04}(\text{ZPSSPN}_j) + u_{0j}$$

The final step tested a 2-2-1 mediation model with self-regulated learning as the outcome variable and faculty trust in students entered as a school-level predictor to assess its mediating effect. School average self-regulated learning (β_{0j}) was predicted to be a function of the grand mean (γ_{00}), the effect of school FRL rate (γ_{01}), percent non-Caucasian (γ_{02}), transformational leadership (γ_{03}), PSSPN (γ_{03}), faculty trust in students (γ_{04}), and school-level error (u_{0j}). The Sobel test of indirect effects was used to determine if the indirect effect of PSSPN through teacher trust in students was statistically different than 0.

2-2-1 mediation model:

$$\text{Level 1: } \text{SRL}_{ij} = \beta_{0j} + r_{ij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{ZFRL}_j) + \gamma_{02}(\text{Zpercent non} - \text{Caucasian}_{ij})$$

$$+ \gamma_{03}(\text{ZTLB}_j) + \gamma_{04}(\text{ZPSSPN}_j) + \gamma_{05}(\text{FTS}_j) + u_{0j}$$

Results

Descriptive statistics and bivariate correlations for student and school-level variables are reported in Tables I and II. Correlation coefficients in Table I show no statistically significant relationships between student demographics and self-regulated learning. As a result of the correlation findings, student demographic controls were not included in the HLM models. Different results were found at the school level. School compositional factors of FRL rate and percent of students identified as non-Caucasian were related to faculty trust in students and PSSPN, necessitating inclusion of these conditions as statistical controls in the HLM analyses.

Two ICC estimates were used to examine the multi-level nature of the data (Table III). Results report large between-school variance (ICC-1) and within-group agreement (ICC-2) for PSSPN (ICC(1) = 0.31, $\chi^2 = 380.41$, df = 70, $p < 0.01$; ICC(2) = 0.80, df = 0.70, $F = 3.97$, $p < 0.01$) and faculty trust in students (ICC = 0.34, $\chi^2 = 373.62$, df = 70, $p < 0.01$; ICC (2) = 0.85, df = 70, $F = 5.24$, $p < 0.01$), justifying their measurement as school properties (Van Houtte and Van Maele, 2011). Self-regulated learning did vary significantly across schools (ICC = 0.10, $\chi^2 = 505.41$, df = 70, $p < 0.01$), but within-group agreement did not reach the 0.70 standard to justify aggregation (Cohen *et al.*, 2001).

Table IV includes evidence to test the hypotheses. Results in column 1 support the first hypothesis. When controlling for FRL rate, percent non-Caucasian, and transformational

Student level	Mean	SD	FRL	Non-Caucasian	SRL
FRL status	0.77	0.41	1.0	0.33**	−0.04
Non-Caucasian	0.73	0.44		1.0	0.02
SRL	3.07	0.48			1.0
Notes: $n = 3{,}171$ students. **$p < 0.01$					

Table I. Descriptive statistics and bivariate correlations for student variables

School-level variables	Mean	SD	FRL rate	NC	TLB	FTS	PSSPN
FRL rate	84	20	1.0	0.76**	−0.13	−0.29**	−0.20
Percent non-Caucasian	0.64	0.18		1.0	−0.23	−0.25*	−0.30**
Transformational leadership	4.54	0.70			1.0	0.17	0.60**
Faculty trust in students	3.01	0.26				1.0	0.49**
Principal support for student psychological needs	4.28	0.61					1.0
Notes: $n = 71$ schools. *$p < 0.05$; **$p < 0.01$							

Table II. Descriptive statistics and bivariate correlations for school variables

Variable	ICC(1)	df	χ^2	ICC(2)	df	F-ratio
PSSPN	0.31	70	380.41**	0.80	70	3.97**
Faculty trust in students	0.34	70	373.62**	0.85	70	5.24**
Self-regulated learning	0.10	70	505.41**	0.31	70	1.34
Notes: $n = 3{,}171$ students, 601 teachers, and 71 schools. **$p < 0.01$						

Table III. Intraclass correlation coefficients

Fixed effects	Model 2: FTS	Model 1: SRL	Model 3: SRL mediation
School predictors			
FRL rate	−0.25 (0.09)**	0.01 (0.05)	0.04 (0.04)
Percent non-Caucasian	−0.14 (0.11)	−0.01 (0.06)	−0.01 (0.05)
TLB	0.06 (0.06)	−0.14 (0.05)*	−0.06 (0.03)
PSSPN	0.14 (0.06)*	0.23 (0.05)**	0.08 (0.04)*
Faculty trust in students	–	–	0.23 (0.03)**
Deviance (−2 log likelihood)	1,552	8,770	8,745
ΔDeviance	−27**	−5	−29**
Explained school variance	49%	30%	80%

Notes: $n = 3{,}171$ students, 601 teachers, and 71 schools. TLB represents transformational leadership behavior. Sobel test indicates that the indirect effect of PSSPN through FTS was statistically significant ($Z = 4.36$ (0.01). *$p < 0.05$; **$p < 0.01$

Table IV. Results of the HLM random intercepts and mediation models

leadership, PSSPN was positively related to faculty trust in students ($\gamma_{04} = 0.14$, $p < 0.05$). Although FRL rate had the strongest relationship to faculty trust in students ($\gamma_{01} = -0.25$, $p < 0.01$), the contribution of PSSPN was statistically significant and moderately strong. The combined model explained approximately 49 percent of the school variance in faculty trust with a change of deviance of 27 points, a statistically significant amount from the unconditional model.

The second hypothesis was also supported. PSSPN was positively related to self-regulated learning ($\gamma_{04} = 0.23$, $p < 0.01$), and it had the strongest unique effect when compared to school control variables in the model. An increase of one standard deviation in PSSPN at the school level resulted in a 0.23 standard deviation increase in average self-regulated learning. The school compositional factors of FRL rate and percentage of non-Caucasian students were not related to school differences in self-regulated learning. Further, transformational leadership had a negative relationship to self-regulated learning. This is likely the result of shared variance between PSSPN and transformational leadership. The model explained approximately 30 percent of the school-level variance with a reduced deviance of five points from the unconditional model.

Baron and Kenny's (1986) criteria for mediation were used to evaluate the third hypothesis. Accordingly, mediation exists when there is an estimated direct effect of the independent variable (PSSPN in this case) on the dependent variable, there is a direct effect of the independent variable on the mediator (faculty trust in students), and the inclusion of the mediator in the regression model reduces the strength of the direct effect of the independent variable. As reported for *H1* and *H2*, the first two criteria for mediation were satisfied. Model 1 established a unique, direct relationship between PSSPN and faculty trust in students ($\gamma_{04} = 0.14$, $p < 0.05$), and model 2 established a unique, direct relationship between PSSPN and self-regulated learning ($\gamma_{04} = 0.23$, $p < 0.01$).

Results to evaluate evidence against the third mediation criterion appear in Model 3. As shown, faculty trust in students had a positive and statistically significant relationship with student self-regulated learning ($\gamma_{05} = 0.23$, $p < 0.01$). Moreover, the inclusion of faculty trust reduced the effect of PSSPN from 0.23 to 0.08, suggesting that faculty trust accounted for nearly three-quarters of the variance in self-regulated learning attributed to PSSPN. Additionally, the mediation model had the strongest mode fit with 80 percent of the school-level variance in self-regulated learning explained and the reduction of deviance of 29 points, a statistically significant amount. The Sobel test statistics confirmed a statistically significant indirect effect ($Z = 4.36$ (0.01), $p < 0.00$). The above findings lead to the conclusion that faculty trust in students mediates the PSSPN-self-regulated learning relationship.

Discussion
This study tested whether or not information communicated between principals and teachers would be related to features of a healthy learning environment. Although considerable attention has been devoted to the relational aspect of the principalship, the evidence has effectively ignored the content of information exchanged during interactions. Derived from self-determination theory, PSSPN reflects principal-teacher conversations based on the essential position of psychological needs in student learning and development. Notwithstanding limitations in the research design, the empirical results offer encouraging evidence that the content of principal-teacher interactions may be an overlooked aspect of effective leadership.

Theory and evidence behind the hypotheses offer an explanation for how PSSPN works. We do not know exactly why, but the empirical results indicate that something about teachers perceiving principals as engaging them in conversations about students' need-support is related to faculty trust in students. Trust beliefs emerge as one party judges the actions of another party to be consistent with expectations and responsibilities of their role group (Forsyth *et al.*, 2011; Bryk and Schneider, 2002). The effort students put forward

in school and how they act toward teachers has considerable influence over teacher trust beliefs. Principal-teacher conversations do not control or regulate student behavior in classrooms and across schools, but the messaging within the conversations can lead to an understanding of student actions that would indeed affect teacher trust discernments. The discernment process is where we see PSSPN intervening.

As argued in our rationale, conversations are meaning-making processes where understanding of phenomena emerge as information is weighed and judged through an external representation (Pask, 1976; Scott, 2001). We believe PSSPN functions as a useful representation for intentional principal interactions with teachers. Once established, PSSPN helps teachers see student behavior as a response to social conditions that nurture or thwart student autonomy, competence, or relatedness. In this case, unacceptable behavior that would normally raise questions about student trustworthiness may instead lead teachers to search for an explanation behind the undesirable behavior. It may be that PSSPN guards against violations of trust by enabling teachers to construct a deeper understanding of the social and psychological sources of student motivation and performance.

At this point, claims about the PSSPN-trust relationship are tentative, as they derive largely from conversation theory and the basic psychological needs dimension of self-determination theory. Evidence from this study does not capture the degree to which teacher knowledge and understanding of student psychological needs improved as a result of PSSPN, nor does it specifically account for the intentionality of principals in engaging teachers in need-supporting conversations. Additional evidence is needed to better evaluate the theoretical argument for how and why PSSPN and faculty trust in students are related.

Similar to the argument for faculty trust, the PSSPN-self-regulated learning relationship derives from existing theory and evidence. Specifically, the social contagion of motivational orientations and styles explains how the actions of a third party, in this case principals, can translate into behavioral tendencies of students. The pathway connects PSSPN to students by way of teachers and their approach to student learning. Teachers who experience administrators as emphasizing student psychological needs are inclined to apply a similar orientation toward their practice, resulting in a classroom context that is capable of nurturing student inner regulation.

Why and how the social contagion of need-support works was not addressed by our data; however, existing evidence implies that the answer may partly come from autonomy and competence supportive teaching. When faculty perceive students as responsible and inherently engaged in school work, it becomes easier to organize learning through social controls that provoke internal regulation (Sarrazin *et al.*, 2006; Pelletier and Vallerand, 1996). Lower trust has the opposite effect. Teachers tend to control behavior with stronger external mechanisms when students seem unmotivated and apathetic toward academic tasks (Forsyth *et al.*, 2011; Adams *et al.*, 2015). Evidence that principal-teacher conversations have consequences for faculty trust in students establishes a starting point for restoring cooperative student-teacher interactions that may have eroded over time.

In summary, PSSPN shows promise as a social-psychological pathway to a healthy learning environment. Healthy schools maintain several more attributes than simply having strong faculty trust in students and students who internalize the value of academic success, but these features are part and parcel of conditions that make schools exciting places to teach and stimulating settings to learn. For school principals, the prospect of cultivating enriching climates can be as straightforward as engaging teachers in intentional conversations about student psychological needs and need-supporting strategies.

Implications for research and practice
This study establishes PSSPN as a viable leadership concept to develop through additional research. The findings supported the hypotheses, but in doing so they also elicit additional

questions that the research was not designed to answer. For instance, what is the causal relationship between PSSPN and conditions of healthy schools? Measuring the degree of PSSPN as reported by teachers, instead of introducing it as a treatment in schools, limits understanding of causal processes behind leadership actions, teacher practices, and student outcomes. Future research needs to test the effects of PSSPN by introducing it into leadership practice as a social-psychological intervention.

Another question stemming for the findings includes: what is the relationship between PSSPN and instructional practices? Our explanation for the mediating effect of faculty trust came from existing evidence on social contagion. It will be important to exam if, how, and why PSSPN steers instructional practices toward need-supporting teaching strategies. From a qualitative approach, discursive analysis can be applied to explore how principals use conversations to influence the mindsets and actions of teachers and other school members. These are just a few questions that can be addressed in future research.

Practical implications emerge from the findings as well. PSSPN would seem to function as a useful heuristic for leadership conversations. Whether a young principal or seasoned veteran, conversations can be a messy and emotionally charged process to navigate. Without a cognitive schema, interactions may drift toward congeal exchanges. Congeniality may be appropriate for relationship building but not for questioning assumptions and beliefs behind practices that prevent schools from adapting to student needs in ways that prepare them for a post-industrial society. Additionally, critical interactions that need to occur may not happen if principals do not know what to focus conversations on. PSSPN establishes a clear framework that can inform interactions in formal settings, like teacher evaluation and improvement planning, or during the many informal conversations principals have with teachers.

Conclusion
Even though conversations underlie leadership practice, research has not mapped the social-psychological pathway between information communicated by principals and the quality of learning experienced by students. PSSPN lays out a theoretically based framework to guide principal conversations toward the science of student growth and development. Such interactions may contain the information and energy to transform a stagnant educational system into one that restores in students their natural propensity to inquire, question, think critically, solve problems, and adapt to new situations. PSSPN directs leadership research and practice to the natural source of principal influence – the language used to help teachers construct meaning from their interactions with students.

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Further reading

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Appendix 1. Confirmatory factor analysis results for principal support for student psychological needs
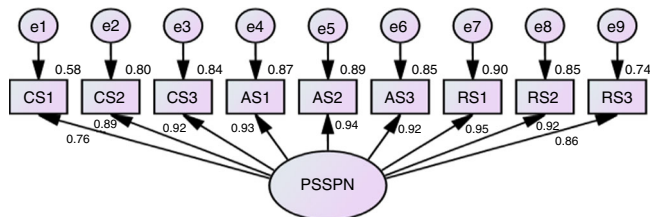

Figure A1.
Confirmatory factor analysis of PSSPN scale

Notes: All standardized factor loadings are statistically significant at $p < 0.01$. $\chi^2(27) = 400.734$, $p < 0.001$; CFI=0.96; TLI=0.94; RMSEA=0.06, 90% CI (0.052, 0.070)

Appendix 2. Exploratory factor analysis results for transformational leadership behaviors, faculty trust in students, and self-regulated learning

	Factor loadings	Eigenvalue	% of variance
The principal at this school…	1 factor	5.4	77.45
Inspires others with his/her plans for the future	0.92		
Provides a good model for me to follow	0.93		
Develops a team attitude and spirit among faculty/staff	0.91		
Insists on only the best performance	0.73		
Behaves in a manner thoughtful of my personal needs	0.85		
Asks questions that prompt me to think	0.86		
Commends me when I do a better than average job	0.78		
Cronbach's $\alpha = 0.95$			
Faculty trust in students	1 factor	7.67	60.91
Teachers in this school trust their students	0.81		
Students in this school can be counted on to do their work	0.80		
Teachers in this school believe students are competent learners	0.86		
Students in this school care about each other	0.78		
Students in this school are secretive	0.77		
Self-regulated learning	1 factor	4.5	58.86
I do my homework because I think it is important	0.73		
I do my classwork because I want to learn new things	0.89		
I do my classwork because doing well in school is important to me	0.75		
I try to do well in school because I like doing a good job on my work	0.74		
I do my homework because I want to learn new things	0.80		
I do my homework because I want to understand the subject	0.81		
Cronbach's $\alpha = 0.87$	0.77		

Table AI.
Factor loadings, eigenvalues, and explained variance

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