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Igniting students’ inner determination: the role of a need-supportive climate

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Abstract

Purpose – Self-determination theory was used to conceptualize a type of school climate that has consequences for the social, emotional and cognitive well-being of students. The purpose of this paper is to argue that a need-supportive climate emerges through a general pattern of interactions that students experience as supporting their psychological needs.

Design/methodology/approach – A hypothesized model was tested whereby the latent need-supportive climate variable was predicted to work through identification with school to influence student grit. Ex post facto data were collected during the 2015–2016 school year from a random sample of students in either the 5th, 8th, or 11th grades in 71 schools located in a southwestern city in the USA. A total of 3,233 students received surveys. Of these students, the authors received useable responses from 2,587 students for a response rate of 80 percent.

Findings – Findings support the hypothesis that autonomy-support, competence-support and relational-support are integrated and combine to shape experiences that align with student psychological needs. Additionally, students who experienced a need-supportive climate were also more likely to identify with school and expressed higher grit toward academic pursuits.

Originality/value – A need-supportive climate adds meaning to more general characterizations of school life (e.g. healthy, supportive, open, etc.) and it affords a theoretically derived explanation for how the social side of schools nurtures the inner determination of students to excel.

Keywords Self-determination theory, School climate, Need-supportive climate, Student determination

Paper type Research paper

A healthy school climate is often cited as means by which school leaders can create safe, fun, and engaging places for students to learn (Cohen et al., 2009; Thapa et al., 2013). For as much attention that climate attracts in practice and research, it is remarkable that many questions about how it activates or constrains student learning remain unaddressed. Climate research suffers from some of the same problems as effective schools research; it largely advances characteristics of healthy schools more so than it uses general social science theory to explain how and why certain conditions affect student performance (Thapa et al., 2013). In response to this problem, we draw on self-determination theory (SDT) to conceptualize a need-supportive climate as one that has consequences for the inner determination of students.

School climate and SDT
School climate research and SDT share a similar focus on the healthy and generative side of school life. School climate research has found increased student engagement, less bullying, better performance and more happiness generally occur in schools where students feel connected to adults and peers and experience a sense of belonging to the community (McNeely et al., 2002; Thapa et al., 2013; Whitlock, 2006). Evidence informing SDT includes...
similar affective and behavioral consequences attributed to healthy, relational connections (Deci and Ryan, 2016). A critical difference, though, is that SDT has established an empirically based explanation for how task contexts affect mindsets, behavior and personality (Reeve et al., 2008; Reeve and Jang, 2006). Accordingly, the bridge connecting the social and behavioral nature of human development consists of our basic psychological needs. Need, as defined by Ryan and Deci (2002), is an internal, biological force that supplies the energy to sustain purposeful and goal-directed action. Much like calories sustain physical activity, psychological needs fuel the autonomous motivation for an activity (Reeve et al., 2008; Reeve and Halusic, 2009).

Extensive empirical evidence has identified autonomy, competence and relatedness as three psychological needs inherent in all individuals (Adams et al., 2015; Deci and Ryan, 2000, 2008). For students, autonomy is a psychological state characterized by perceived agency and internal control over learning goals and outcomes. Competence is an inner belief that one can meet the challenges of schoolwork and perform at high academic levels (Niemiec and Ryan, 2009). Relatedness reflects feelings of security, attachment and belonging to educators and the school (Adams et al., 2015; Ryan and Deci, 2000).

SDT bases the inner determination for completing a task or achieving a future goal on a social–psychological interaction in which the needs of autonomy, competence and relatedness are activated by one’s environmental surroundings (Reeve and Jang, 2006).

Support for psychological needs is the social dimension underpinning autonomous motivation, purposeful behavior and healthy personality; it represents aspects of one’s surroundings that can draw out or suppress innate tendencies toward growth (Adams et al., 2016; Assor et al., 2002; Jang et al., 2010; Soenens and Vansteenkiste, 2005). We argue that need-support resides in the relational network from which the climate of schools emerges. Climate, what some scholars have termed the personality or character of the school (Cohen et al., 2009; Halpin and Croft, 1963; Hoy, 1990), forms through patterns of interactions and exchanges that shape the degree to which students experience schooling as internally fulfilling and generative or as controlling and diminishing (Van Maele and Van Houtte, 2011). Teacher–student interactions represent a dimension of school climate that can reduce at-risk behaviors such as bullying, chronic absenteeism and drug/alcohol use, while simultaneously promoting healthy mindsets and behaviors that enable students to work toward their potential (Thapa et al., 2013).

SDT expands knowledge of school climate by allowing for hypotheses on the social determinants of human motivation, personality and growth to be advanced and tested empirically. In this way, SDT functions as a middle range theory (Merton, 1968) for school climate research. Middle range theory seeks to consolidate empirical regularities by explaining the interaction of different phenomena (Boudon, 1991). Applied to school climate, we know that school life affects the behavior and development of teachers and students alike, but we do not know how this process unfolds or why a school environment can nurture or constrict optimal student growth. SDT advances an explanation centered on the social–psychological interaction that occurs when students engage with teachers in the learning process (Deci and Ryan, 2016). We argue that an optimal interaction originates from a need-supportive climate.

**A need-supportive climate**
In educational literature, climate often takes on organizational-level meanings, reflecting collective attributes that distinguish one school environment from others (Cohen, 2006; Cohen et al., 2009). Such research conceptualizes and measures climate as an organizational property emergent in the shared perceptions of school role groups. There is another type of climate—psychological climate—that gets less conceptual attention. Different than an organizational property, psychological climate accounts for the perceptual representations
that individuals form about aspects of the organization (Glick, 1985; Parker et al., 2003). Features of organizational life—relationships, policies, structures, leadership, etc.—are objects of individual discernments, much like in organizational climate, but discernment at a psychological level is uniquely personal, capturing an individual’s subjective experiences within the organization (Parker et al., 2003).

A need-supportive climate is appropriately conceptualized as an individual student perception shaped through repeated interactions with teachers. It is a form of psychological climate in that it manifests itself as an individual discernment of teacher behaviors, dispositions and actions. Schools may be organized to support psychological needs, but if students do not experience teachers as supportive of autonomy, competence and relatedness then the social spark behind performance may not be ignited (Deci and Ryan, 2016).

With the above in mind, we define a need-supportive climate as one where students experience their interactions with teachers as autonomy-supportive, competence-supportive and relational-supportive. Teachers can support autonomy beliefs by emphasizing relevance in learning, using non-controlling informational language to engage students, allowing choice in the selection of tasks and projects, and encouraging independent thinking (Deci et al., 1994; Jang et al., 2010; Reeve and Jang, 2006). Autonomy-support (AS) is constrained when teachers and schools regulate student behavior by suppressing independent thinking, forcing students to complete meaningless and uninteresting tasks, and using excessive external contingencies to motivate desired behavior (Assor et al., 2002).

A competence-supportive school environment is one in which students are able to set optimally challenging goals, experience mastery (both personally and vicariously) and receive positive and constructive feedback (Ryan and Deci, 2000). When competence-support (CS) is present, students perceive they are rewarded for personal improvement and learning rather than simply achieving a valued test score (Cox and Williams, 2008). Students experience relational-support (RS) when they perceive teachers as sufficiently exhibiting trustworthy behaviors: benevolence, openness, honesty, reliability and competence (Adams, 2014). Trustworthy behaviors establish attachments that motivate students to see learning and schooling as a means to goals and dreams, rather than meaningless tasks that lack purpose (Adams et al., 2015).

Conceptualizing a need-supportive climate as emergent in AS, CS and RS differs from existing studies that largely view optimal social conditions through an autonomy-supportive prism (Niemiec and Ryan, 2009; Reeve, 2002; Soenens and Vansteenkiste, 2005). Many SDT scholars have argued that AS functions as the primary activator of student psychological needs (see Deci and Ryan, 2016; Reeve, 2006; Ryan and Deci, 2017). Such beliefs are backed-up by extant evidence linking autonomy-supportive practices to desired student behaviors and outcomes, such as active involvement in class activities, internalization of school work and greater student effort (Assor et al., 2002; Bozack et al., 2008; Chirkov and Ryan, 2001; Niemiec and Ryan, 2009; Reeve, 2002, 2004). Nonetheless, general teacher behaviors within the autonomy-supportive spectrum only cover a narrow set of competencies and processes used by teachers to engage students in the learning process.

Many of the autonomy-supportive strategies described in the literature, such as fostering relevance, allowing voice and choice and encouraging independent thinking (Niemiec and Ryan, 2009) do not specifically target factors behind student competence and relatedness. To illustrate, competence grows by achieving optimally challenging and satisfying learning goals (Reeve, 2002). Ideal instructional routines for increasing competence need to establish clear and achievable expectations, scaffold experiences to support achievement of intended objectives, monitor and recognize student progress, and provide informationally significant feedback (Deci and Ryan, 2016; Niemiec and Ryan, 2009). Efforts to make course content relevant, to afford students choices, and to stimulate
independent thinking may not arouse competence to the same degree as instructional routines that make learning visible to students and teachers. Autonomy-supportive interactions in tandem with competence-supportive structures integrate a broader set of instructional strategies that align with these psychological needs.

We make a similar argument with RS. Strategies defined as autonomy and competence-supportive may arouse positive affective feelings, but we can also envision situations and students who may not experience teachers employing these strategies as relationally supportive. Our point is that a need-supportive climate provides better conceptual alignment with autonomy, competence, and relatedness; it also includes a broader set of instructional strategies than what is covered with AS. Furthermore, a need-supportive climate establishes three pathways to connect the extrinsically motivated student with the learning process. Some students may engage cooperatively with teachers through AS and others may enter the process through RS or CS. In short, a need-supportive climate embodies a learning context responsive to the unique psychological state of students.

Hypothesized model and rationale
We hypothesize that a need-supportive climate is a function of the shared variance among student perceived AS, CS and RS (Figure 1). This argument derives from the basic psychological needs dimension of SDT. Only focusing on AS, as previous studies have done, overlooks the assumed interdependency of psychological needs (Deci and Ryan, 2012), and it diverges from the interaction proposition of SDT (Deci and Ryan, 2016). Just as evidence attributes optimal human functioning to the activation and interaction of all three psychological needs (La Guardia et al., 2000), it seems logical that autonomy, competence and relational-support maintain reciprocal relationships. Autonomy and competence-support are less likely to be experienced in an impersonal context devoid of nurturing relationships. Similarly, RS partly depends on students’ perceiving teachers as effectively emphasizing and promoting academic excellence.

The hypothesized structural relationships come from the organismic integration element of SDT (Figure 2). Accordingly, internal determination that is externally motivated can be triggered from outside the individual when social surroundings enable a person to identify with the purpose and value of a task (Reeve, 2002; Reeve et al., 2004). The external source behind behavior is of interest to us because many students do not engage in school out of inherent pleasure and joy; rather, their engagement varies based on numerous factors in their social environment (Ryan and Deci, 2017). A need-supportive climate is one such social factor, and we postulate that students who experience autonomy, competence, and relational-support will internalize the value of school and display higher levels of inner determination.

![Figure 1. Hypothesized measurement model representing the higher-order nature of a need-supportive climate (NSC) as a function of relational-support (RS), competence-support (CS) and autonomy-support (AS).](image-url)
Internalization, from a SDT perspective, resides in a belief that school, while maybe not inherently interesting, has consequential functions for one's life and desired future opportunities (Deci and Ryan, 2016). The concept of school identification aligns with this notion of internalization. School identification exists when students find value in school and view it as important for their growth and development (Mitchell, 2008; Voelkl, 1997). Value congruence benefits from supportive teacher relationships and appropriately challenging, interesting and engaging academic tasks; these conditions reflect the social ingredients of a need-supportive climate (Reeve, 2006, 2012; Tschannen-Moran et al., 2013).

Continuing with the hypothesized structural relationships, we predict that school identification mediates the relationship between a need-supportive climate and greater levels of self-reported grit. Grit is an inner resource that fuels peak performance in many different settings and contexts (Duckworth et al., 2009; Duckworth and Gross, 2014). It is defined as a person who pursues long-term goals with zeal, persistence and resilience (Duckworth et al., 2009; Eskreis-Winkler et al., 2014; Robertson-Kraft and Duckworth, 2014). This personality state is related to higher grade point averages for students in Ivy League universities, retention at the United States Military Academy, college attainment, and better math and reading achievement (Duckworth et al., 2007). The gritty student persists when faced with challenges, remains steadfast in pursuit of his/her long-term goals, and draws on his/her autonomous motivation for actions that lead to positive outcomes (Duckworth, 2016).

The mediation argument comes from evidence linking social identity processes to psychological characteristics (Bizumic et al., 2009). Social identity has been found to function as a bridge, connecting a nurturing environment with psychological factors behind self-perceptions and behavior (Turner et al., 2014). The social–psychological interaction resembles the pathway to grit. Duckworth (2016) argues that grit develops when individual experiences and opportunities cultivate passion, interest, purpose and hope. When a student identifies with school, she develops the inner determination to work harder, persist in tasks, value school work and engage in the learning process (Tschannen-Moran et al., 2013). These behaviors embody the inner drivers behind grit. Thus, we argue that a need-supportive climate activates school identification which in turn facilitates academic grit in students.

**Empirical study**

We used a non-experimental, survey research design for the empirical investigation. Ex post facto data were collected during the 2015–2016 school year from a random sample of students in either the 5th, 8th or 11th grades in 71 schools located in a southwestern city in the USA. Schools were part of the same school district, allowing us to hold constant external factors like state policies, district strategies and district processes that may confound...
relationships at the center of the empirical investigation. Additionally, the schools were selected purposefully because they reflect demographics of many city schools in the USA.

Schools provided student rosters for each of the above grade levels. We used the rosters to randomly sampled students who would receive the survey. Surveys were administered to a total of 3,233 students during the school day. We received useable responses from 2,587 students for a response rate of 80 percent. Of these students, 77 percent qualified from the federal lunch subsidy, 48 percent were female and 72 percent identified as an ethnic minority. These demographic statistics are representative of the student populations in many US cities. The Council of the Great City Schools (2016) reports that 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.

Measures

Autonomy-support

Student perceived AS was operationalized with the Autonomy-Enhancement Scale (Assor et al., 2002). Items on the scale capture the facets of fostering relevance, providing choice, establishing rationale for instructional activities and encouraging independent thinking. Eight items with a Likert response set ranging from 1 (strongly disagree) to 4 (strongly agree) were used. Sample items include: “Teachers allow students to decide things for themselves.” “Teachers listen to the opinions and ideas of students.” “Teachers explain why it is important to study certain subjects in school.” Reliability of the scale is strong with a Cronbach’s \( \alpha \) of 0.82.

Competence-support

In the suite of measures used in SDT research, we could not find a scale that captures competence-support. Thus, we used eight items from the academic press scale used by the Consortium on Chicago School Research (see: https://ccsr.uchicago.edu) to measure CS. Items measure student perceptions of the instructional practices of teachers using a Likert response set ranging from 1 (strongly disagree) to 4 (strongly agree). Sample items include: “Teachers in this school really make students think.” “Teachers in this school challenge students to achieve academic goals.” “Teachers in this school celebrate the achievement of students.” The scale has strong reliability with a Cronbach’s \( \alpha \) of 0.88. Scale items maintain strong conceptual alignment with competence-supportive practices directed toward establishing optimally challenging goals and supporting students in mastery experiences (Ryan and Deci, 2000).

Relational-support

Similar to CS, the suite of measures used in SDT research does not include a scale on relational-support. Thus, was measured RS with the student trust in Teachers Scale (Adams and Forsyth, 2009). Like other trust measures, the student trust scale operationalizes trustworthiness through student shared perceptions of the openness, benevolence, competence, honesty and reliability of teachers. Out of the 13 items, 5 from the scale were used. Items with the five highest factor loadings and covering all trust facets were selected. The scale uses a four-point Likert response set ranging from strongly disagree coded as 1 to strongly agree coded as 4. Sample items include: “Teachers are always ready to help at this school.” “Teachers at this school really listen to students.” and “Teachers at this school are good at teaching.” Scale reliability is strong with a Cronbach’s \( \alpha \) of 0.92.
Student identification with school

We used five items from Voelkl’s (1997) identification with school questionnaire to operationalize school identification. Items capture the degree to which students’ value school as a social institution and as a means for future promise (Tschannen-Moran et al., 2013). Items were written with a four-point Likert response set ranging from 1 (strongly disagree) to 4 (strongly agree). Sample items include: “The things we learn in class are meaningful.” “School is one of the most important things in my life.” “Most of what I learn in class will be useful when I get a job.” The Cronbach’s $\alpha$ of 0.89 indicates strong reliability.

Grit

We used the Grit Scale by Rojas et al. (2012) to measure student grit. Items measure student passion and perseverance to pursue long-term academic goals. The scale consists of ten items with a Likert response set ranging from 1 (strongly disagree) to 4 (strongly agree). Sample items include: “If a task is hard, I give up easily.” “I keep at my homework until I am done with it.” “I keep trying even after I fail.” The scale has strong reliability with a Cronbach’s $\alpha$ of 0.84.

A Harmon single-factor test was used to evaluate potential common measurement bias associated with using self-report measures. This test calls for using exploratory factor analysis to estimate common variance among on all survey items. Measurement bias is likely problematic if items load strongly on one factor (Podsakoff et al., 2003). In our test, four factors emerged with eigenvalues over one, suggesting that common measure bias is not a likely concern with these data.

Analytical technique

We first used confirmatory factor analysis to test the measurement structure of a need-supportive climate. Next, a full structural equation model was used to explain the relationships between the higher-order nature of student self-regulated climate (SRC) represented by lower-order factors of RS, CS and AS. In addition to the measurement component, the model was used to explain the structural relationships among SRC, student identification (SID) and grit. Mediation was evaluated with Sobel’s test (Preacher and Hayes, 2008). Estimates used for Sobel’s test came from a model that specified direct and indirect effects of a need-supportive climate of grit. All analyses were conducted using R 3.2.4. The model was estimated using the lavaan (latent variable analysis) package with robust maximum likelihood (MLR) due to the nature of the ordinal, Likert-type items. MLR was the chosen estimation method because it is robust to violations of non-normality and can be used with ordinal items (Finney and DiStefano, 2006).

Assessment of model fit was considered using Hu and Bentler’s (1999) recommendations and include common fit indices such as the model’s scaled $\chi^2$ value, the comparative fit index (CFI > 0.95), the standardized root mean residual (SRMR < 0.08) and the root mean square error of approximation (RMSEA < 0.06). Parameter estimates were examined to test the strength of the hypothesized structural relationships among the variance and co-variance of the sample data.

Results

Means, standard deviations and bivariate correlation coefficients are reported in Table I. Results report very weak and non-statistically significant relationships among student demographic variables and the measured variables in the study. Consistent with our theoretical conceptualization of a need-supportive climate, student perceived AS, CS and RS were statistically significant and strongly related to each other. Statistically significant and
strong relationships were also found between the latent factors of a need-supportive climate and school identification and grit.

The initial step was to test the measurement model of the latent factors. Results of the model fit were: $\chi^2(692) = 2,688.602, p < 0.001$ (Yuan-Bentler scaling factor = 1.335); CFI = 0.942; SRMR = 0.032; RMSEA = 0.032, 90% CI (0.033, 0.035). Results of the fully latent structural equation model appear in Figure 3. Parameter estimates for the observed indicators were omitted for clarity (refer to Table II for detailed parameter estimates). The model fit the data well, supporting our hypothesis that a need-supportive climate is a higher order factor made up by the first-order factors of student trust, CS and autonomy-support. Specifically, CFI was 0.94, SRMR was 0.03 and RMSEA was 0.03 with a 90 percent confidence interval of 0.033–0.035.

<table>
<thead>
<tr>
<th>School-level variables</th>
<th>Mean</th>
<th>SD</th>
<th>FRL</th>
<th>NC</th>
<th>AS</th>
<th>CS</th>
<th>RS</th>
<th>SID</th>
<th>Grit</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRL</td>
<td>0.77</td>
<td>0.41</td>
<td>1.0</td>
<td>0.33**</td>
<td>0.00</td>
<td>-0.03</td>
<td>-0.05</td>
<td>-0.01</td>
<td>-0.03</td>
</tr>
<tr>
<td>Non-caucasian</td>
<td>0.72</td>
<td>0.44</td>
<td>1.0</td>
<td>-0.05</td>
<td>-0.01</td>
<td>-0.03</td>
<td>-0.02</td>
<td>-0.02</td>
<td></td>
</tr>
<tr>
<td>Autonomy-support</td>
<td>2.8</td>
<td>0.58</td>
<td>1.0</td>
<td>0.74***</td>
<td>0.67***</td>
<td>0.62***</td>
<td>0.40**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence-support</td>
<td>3.0</td>
<td>0.61</td>
<td>1.0</td>
<td>0.73***</td>
<td>0.65***</td>
<td>0.47***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relational-support</td>
<td>2.9</td>
<td>0.58</td>
<td>1.0</td>
<td>0.67***</td>
<td>0.45***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School identification</td>
<td>2.8</td>
<td>0.52</td>
<td>1.0</td>
<td>0.54***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grit</td>
<td>3.1</td>
<td>0.48</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** $n = 2,587$. Means for FRL and non-Caucasian report the percentage of students in the sample who qualified for the FRL subsidy and the percentage of students who identified as non-Caucasian. Means for the measured variables are the average item response for survey questions. **$p < 0.01$
In addition to good model fit, parameter estimates for the structural relationships among the latent variables were statistically significant and strong. The standardized regression coefficients appear in parenthesis next to the unstandardized estimates. Student perceived SRC had a large, positive effect on SID with school ($\beta = 0.84$, df = 697, $p < 0.01$), explaining approximately 70 percent of the variance. A one standard deviation increase in a need-supportive climate was associated with a 0.84 standard deviation increase in SID. SID with school had a large effect on grit ($\beta = 0.72$, df = 697, $p < 0.01$), explaining about 51 percent of the variance. A one standard deviation increase in SID was associated with a 0.72 standard deviation increase in grit. Model fit and parameter estimates combine to support our hypothesized relationships among a need-supportive climate, school identification and grit. A statistically significant Sobel test (10.17, $p < 0.001$) establishes additional empirical support for the mediation of SID.

<table>
<thead>
<tr>
<th>Parameter estimate</th>
<th>Unstandardized</th>
<th>Standardized</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS $\rightarrow$ RS1</td>
<td>1.000</td>
<td>0.517</td>
<td></td>
</tr>
<tr>
<td>RS $\rightarrow$ RS2</td>
<td>0.981 (0.032)</td>
<td>0.508</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS3</td>
<td>1.125 (0.032)</td>
<td>0.582</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS4</td>
<td>1.084 (0.032)</td>
<td>0.561</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS5</td>
<td>1.145 (0.034)</td>
<td>0.592</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS6</td>
<td>1.079 (0.036)</td>
<td>0.558</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS7</td>
<td>1.088 (0.032)</td>
<td>0.563</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS8</td>
<td>1.009 (0.034)</td>
<td>0.522</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS9</td>
<td>1.072 (0.033)</td>
<td>0.555</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>RS $\rightarrow$ RS10</td>
<td>1.127 (0.033)</td>
<td>0.583</td>
<td>&lt; 0.001</td>
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<tr>
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<td>1.000</td>
<td>0.610</td>
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<tr>
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<td>0.769 (0.027)</td>
<td>0.469</td>
<td>&lt; 0.001</td>
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<tr>
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<td>0.624</td>
<td>&lt; 0.001</td>
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<td>0.575</td>
<td>&lt; 0.001</td>
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<td>1.058 (0.031)</td>
<td>0.645</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>CS $\rightarrow$ CS6</td>
<td>1.022 (0.028)</td>
<td>0.623</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>CS $\rightarrow$ CS7</td>
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<td>0.530</td>
<td>&lt; 0.001</td>
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<tr>
<td>AS $\rightarrow$ AS1</td>
<td>1.000</td>
<td>0.362</td>
<td></td>
</tr>
<tr>
<td>AS $\rightarrow$ AS2</td>
<td>1.597 (0.075)</td>
<td>0.579</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>AS $\rightarrow$ AS3</td>
<td>1.290 (0.064)</td>
<td>0.467</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>AS $\rightarrow$ AS4</td>
<td>1.678 (0.082)</td>
<td>0.608</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>AS $\rightarrow$ AS5</td>
<td>1.434 (0.081)</td>
<td>0.520</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>AS $\rightarrow$ AS6</td>
<td>1.385 (0.073)</td>
<td>0.502</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>AS $\rightarrow$ AS7</td>
<td>1.438 (0.078)</td>
<td>0.521</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SID $\rightarrow$ SID1</td>
<td>1.000</td>
<td>0.520</td>
<td></td>
</tr>
<tr>
<td>SID $\rightarrow$ SID2</td>
<td>1.117 (0.043)</td>
<td>0.581</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SID $\rightarrow$ SID3</td>
<td>1.153 (0.038)</td>
<td>0.601</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SID $\rightarrow$ SID4</td>
<td>1.065 (0.046)</td>
<td>0.554</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SID $\rightarrow$ SID5</td>
<td>1.203 (0.043)</td>
<td>0.626</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT1</td>
<td>1.000</td>
<td>0.529</td>
<td></td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT2</td>
<td>0.986 (0.027)</td>
<td>0.522</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT3</td>
<td>0.895 (0.028)</td>
<td>0.473</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT4</td>
<td>1.008 (0.036)</td>
<td>0.533</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT5</td>
<td>0.839 (0.033)</td>
<td>0.444</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT6</td>
<td>0.781 (0.032)</td>
<td>0.413</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT7</td>
<td>0.994 (0.032)</td>
<td>0.526</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT8</td>
<td>1.014 (0.033)</td>
<td>0.536</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT9</td>
<td>0.983 (0.029)</td>
<td>0.524</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>GRIT $\rightarrow$ GRIT10</td>
<td>0.976 (0.033)</td>
<td>0.517</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

**Notes:** $n = 2,587$, RS, relational-support; CS, competence-support; AS, autonomy-support; SID, school identification.
Discussion

School climate comes up in many conversations about school quality, effectiveness and improvement. In fact, it is commonly referenced as a remedy for underperforming schools and an attribute of schools where students are engaged, happy and stimulated by their learning (Cohen et al., 2009; MacNeil et al., 2009; Thapa et al., 2013). The casual reference to climate in professional circles, the media, and even in the literature brings broad recognition to the concept, but it does not necessarily contribute to meaningful knowledge on how social features of schools differentially affect student development. Scientific knowledge forms through theory (Kerlinger, 1986), and much of the existing climate research lacks middle range theories that are capable of explaining how social–psychological interactions affect school performance.

Results from the empirical test lend initial and tentative support for advancing a need-supportive climate as a controllable resource that school leaders can leverage for quality student development. A need-supportive climate adds meaning to more general characterizations of school life (e.g. healthy, supportive, open, etc.) and it affords a theoretically derived explanation for how the social side of schools nurtures the inner determination of students to excel. In this discussion we cycle back to SDT to explain the relationship between a need-supportive climate and student inner determination then we consider implications of our findings for school leaders.

A need-support climate and student inner determination

Need-supporting actions of teachers form a climate that students are more likely to experience as nurturing and generative rather than controlling and impersonal. Our findings support the hypothesis that AS, CS and RS are integrated and combine to shape experiences that align with student psychological needs. Strong factor loadings for the latent measurement component of the model indicate that competence-supporting practices partly depend on autonomy and relational supporting actions. Likewise, autonomy and relatedness support are partially shaped by each other and by competence-supporting teachers. Stated simply, all three types of need-support appear to be inextricably related to a larger social context that nurtures students’ inner determination.

We theorized that a need-supportive climate reflects an ideal school environment where the natural propensity of students to learn and grow can be fostered through interactions with teachers (Deci and Ryan, 2016). As we found, students who experienced a need-supportive climate were also more likely to identify with school and expressed higher grit toward academic pursuits. Identification and grit fuel the type of autonomous and persistent behaviors behind which academic and personal goals can be realized (Duckworth et al., 2009; Tschannen-Moran et al., 2013). These inner resources, when activated, supply the energy needed to deal effectively with set-backs and adversity, to learn from mistakes, to persist in challenges and to stay focused on long-term aspirations and goals (Eskreis-Winkler et al., 2014; Robertson-Kraft and Duckworth, 2014).

Our results, consistent with SDT (Deci and Ryan, 2016), add explanatory detail to the social–psychological interaction that unfolds as students engage with their learning environment. Accordingly, schools provide experiences and opportunities by which cognitive and non-cognitive competencies develop (Deci and Ryan, 2016; National Research Council, 2012). Innate potential, however, does not blossom into optimal student growth without the right nutrients from the social environment (Niemiec and Ryan, 2009). Ideal nutrients reside in interactions experienced as need-supportive. Need-supportive interactions appear to depend on each other. That is, experienced AS benefits when students see instruction as appropriately challenging and when teachers are perceived as trustworthy. The power of a need-supportive climate resides in instructional practices capable of tapping into autonomy, competence and relatedness.
Different from prior research on autonomy-supportive teaching styles, a need-supportive climate assumes that optimal social supports for student learning and growth span structures, processes and interactions directed toward autonomy, competence and relatedness. We do not disagree that general autonomy-supportive strategies can guide the formation of nurturing classroom environments, as many SDT scholars have found (see Deci and Ryan, 2016; Niemiec and Ryan, 2009; Reeve, 2006), but teacher—student interactions that establish relevance, enable choices, and elicit independent thinking would seem more powerful and effective when integrated with purposeful efforts to build competence and relatedness. The conceptualization of a need-supportive climate has conceptual congruence with the basic psychological needs dimension of SDT and this initial empirical evidence supports the assumption that need-supports, much like psychological needs themselves, function reciprocally.

At the very least, this study raises important questions into how schools activate student psychological needs. Questions requiring additional empirical attention follow limitations of our research design. First, we did not compare the relative effects of a need-supportive climate to those of autonomy-supportive processes. Future research can test differential effects associated with these two, as well as other, conceptualizations. It would also be valuable to study the functionality of each type of need-support. For example, do autonomy-supportive practices work differently than relationally supportive practices? Second, we did not measure any potential school-level effects. It would be useful to know the extent to which a need-supportive climate varies across schools. Finally, our data were limited to schools in one metropolitan city in the USA. Future research can replicate this study in different school and community contexts.

Implications for school leaders
In a general sense, leading schools involves setting direction, organizing and aligning resources and building collective commitment for a vision and its accompanying processes (Leithwood et al., 2004). Lost in this general description are specific constructs that can be used to define direction and organize members to work in ways that move the school toward a desired future. A need-supportive climate specifies clear features of school life that can make the difference between places where students are driven to excel and those environments where student potential is undermined by the relational network.

As the leadership literature demonstrates, leaders work through teachers and other school actors to create a climate in which quality learning occurs (Robinson et al., 2008; Urick and Bowers, 2011). A need-supportive climate sets a direction for school effectiveness, but to build a culture of need-support school leaders must know how to use the concept in the service of improvement. In organizations like schools, theory combined with evidence spur knowledge creation and learning from practice (Deming, 2000). Theory and evidence, when used to structure collaborative dialogue with faculty and to promote ongoing sense-making around processes and outcomes, builds capacity within the school for meaningful improvement work (Bryk et al., 2015; Urick and Bowers, 2014; Weick, 1995).

School leaders can use a need-supportive climate as a heuristic to study and evaluate the degree to which a school has created growth generating conditions. This requires looking into the enactment of curricula, assessments, and other structures of the school to assess the degree to which instructional practices deliver need-support. For instance, AS reflects schools where teachers foster relevance for instructional tasks, provide choice, establish rationale for instructional activities and encourage independent thinking (Assor et al., 2002). A competence-supportive school environment is one in which students are able to set optimally challenging goals, experience mastery (both personally and vicariously), and receive positive and constructive feedback (Ryan and Deci, 2000). Students experience RS when they perceive teachers as sufficiently exhibiting trustworthy behaviors: benevolence, openness, honesty, reliability and competence (Adams, 2014).
Building a need-supportive climate for many schools will require dramatic changes to entrenched instructional practices that have led to increased boredom, disengagement and disinterest across the country (Fullan, 2015). Change does not come easy to school organizations (Fullan, 2010). To unfreeze established mindsets and practices, school leaders need to understand the function of a basic psychological need for optimal human performance. As seen in our evidence and reinforced by SDT, need-supporting environments tap into the natural capacity and curiosity of students. The objective of school leaders is not to control student behavior with external contingencies, but instead to create conditions that activate the psychological states behind student flourishing.

Conclusion
In closing, we agree with Cohen and colleagues when they argue, “although we have learned a great deal about aspects of school life that color and shape school norms, values, relationship patterns, teaching, and learning, there are many others that we are just beginning to address” (Cohen et al., 2009, p. 206). A need-supportive climate fills a void in the current literature in that it specifies a social environment in which student psychological needs can be nurtured and supported. Further, it derives from SDT, allowing for explanatory evidence on the social–psychological pathway to learning and development to be studied and advanced in ways that inform improvement processes and practices.

Finding psychological effects of a need-supportive climate seem particularly meaningful in light of challenges confronting educational systems in preparing students with a broad and deep set of cognitive and non-cognitive competencies that schools have traditionally struggled to develop (Bellanca, 2015). Successful systems organize and coordinate learning opportunities in ways that stimulate the curiosity, interest and creativity in students (Hallinger and Heck, 2010; Robinson and Aronica, 2015; Schlechty, 2010). We believe that schools responding to changes by building a relational infrastructure supportive of student psychological needs position themselves to use the natural, inner determination of students as a mechanism for deep learning.

References


Halpin, A.W. and Croft, D.B. (1963), Organizational Climate of Schools, Midwest Administrative Center, University of Chicago, Chicago, IL.


Further reading


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