

Autonomy, Belongingness, and Engagement in School as Contributors to Adolescent Psychological Well-Being

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Abstract *Self-determination theory* emphasizes the importance of school-based autonomy and belongingness to academic achievement and psychological adjustment, and the theory posits a model in which engagement in school mediates the influence of autonomy and belongingness on these outcomes. To date, this model has only been evaluated on academic outcomes. Utilizing short-term longitudinal data (5-month timeframe) from a set of secondary schools in the rural Midwest ($N = 283$, M age = 15.3, 51.9% male, 86.2% White), we extend the model to include a measure of positive adjustment (i.e., hope). We also find a direct link between peer-related belongingness (i.e., peer support) and positive adjustment that is not mediated by engagement in school. A reciprocal relationship between academic autonomy, teacher-related belongingness (i.e., teacher support) and engagement in learning is supported, but this reciprocal relationship does not extend to peer-related belongingness. The implications of these findings for secondary schools are discussed.

Keywords Self-determination theory · Autonomy · Belongingness · Positive psychology · Hope

Introduction

Self-determination theory (Deci and Ryan 2000; Deci et al. 1991) has long emphasized the importance of autonomy and belongingness to success in school. For example, high-autonomy learning situations (i.e., situations that provide students with a high degree of choice and self-direction in school) have been found to stimulate student motivation, engagement, and academic achievement (Deci et al. 1981a, b; Flink et al. 1990; Patrick et al. 1993; Ryan and Grolnick 1986; Vansteenkiste et al. 2004). Higher levels of autonomy in school are also related to lower dropout rates (Vallerand and Bissonnette 1992). In contrast, a controlling approach by teachers creates a reduced perception of autonomy in students, which can interfere with performance on complex learning tasks (Grolnick and Ryan 1987).

Academic autonomy has also been found to be essential to psychological well-being (Ryan and Deci 2000). Lower levels of academic autonomy are associated with higher levels of anxiety and negative coping strategies in school, whereas higher levels of autonomy are associated with positive coping strategies (Ryan and Connell 1989). In general, increasing amounts of choice and self-direction both inside and outside of school are critical to adolescent psychological development (Steinberg 1990), and a lack of autonomy during this period can lead to various forms of psychopathology (Ryan et al. 1995) and increased participation in high-risk behaviors (Williams et al. 2000). In short, academic autonomy is an important contributor to adolescent achievement and development.

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Belongingness, or the feeling of being supported and accepted by others, is also critical to adolescents' success in school. In the literature, support from friends, peers and teachers have all been found to promote higher levels of motivation, engagement and academic achievement. For example, the number and/or quality of school friendships have been linked to higher levels of school competence, involvement in the classroom, prosocial behavior and academic achievement (Berndt and Keefe 1995; Cauce 1986; Wentzel et al. 2004). Acceptance and support from the wider peer group can influence engagement in school, prosocial behavior, and academic achievement (Marks 2000; Wentzel 1994; Wentzel and Caldwell 1997), while socially rejected students can have higher levels of academic and behavioral problems (DeRosier et al. 1994) and can be at risk of dropping out of school (Parker and Asher 1987). Finally, supportive teacher-student relationships have been linked to student motivation, engagement, interest in school, prosocial behavior and academic achievement (Roeser and Eccles 1998; Roeser et al. 1998; Ryan and Grolnick 1986; Ryan et al. 1994; Wentzel 1994, 1997, 1998).

Belongingness in school can also influence more general adjustment and well-being (Dubow et al. 1991). Belongingness becomes especially important to well-being as children enter adolescence. During this time, the ability to establish and maintain positive peer relations is linked to higher levels of sociability, perceived competence, and self-esteem, and reduced hostility, anxiousness, and depression (Buhrmester 1990). Like autonomy, belongingness in school is clearly vital to adolescents.

When assessed together, both academic autonomy and belongingness in school have been found to contribute independently to student engagement and academic achievement (Connell and Wellborn 1991; Flink et al. 1990; Ryan and Deci 2000; Ryan and Powelson 1991; Wentzel et al. 2004). These factors also independently predict psychological adjustment, with adjustment conceptualized as lower levels of psychological problems, such as emotional distress and depressive affect (Eccles et al. 1997; Roeser and Eccles 1998; Roeser et al. 1998).

Self-Determination Theory Model

Self-determination theory posits a model linking academic autonomy and belongingness in school to engagement, achievement, and psychological adjustment. In this model, the satisfaction of the need for autonomy and belongingness in the school context contributes to higher levels of engagement in school, which in turn stimulates the development of skills and abilities as well as psychological adjustment (Connell and Wellborn 1991). In other words,

the effect of autonomy and belongingness on achievement and adjustment is not direct, but is mediated by engagement.

In support of this hypothesis, Connell and Wellborn (1991) presented cross-sectional evidence from a series of studies involving both primary and secondary school students. Other research has linked academic autonomy and belongingness in school to engagement (e.g., Marks 2000; Patrick et al. 1993; Ryan et al. 1994), and engagement in turn has been found to predict academic achievement and school completion (Fredricks et al. 2004). However, given that the seminal work by Connell and Wellborn (1991) was limited to achievement-related outcomes, we contend that the ability of engagement to mediate the relationship between autonomy, belongingness, and psychological adjustment must be more clearly defined by empirical evidence. We are particularly interested in the influence of academic autonomy and belongingness in school on *positive* measures of adjustment. The exploration of this topic is one of the primary goals of this study.

Positive Psychological Adjustment

One striking feature of the extant research in this field is its emphasis on negative measures of psychological adjustment, such as emotional distress and depressive affect (e.g., Eccles et al. 1997; Roeser and Eccles 1998; Roeser et al. 1998). In contrast, positive psychology emphasizes the importance of positive psychological adjustment (i.e., self-esteem, self-worth, etc.) as a buffer against mental illness, and researchers in this field have called for the creation of social climates (e.g., schools) that foster this sort of positive adjustment (Seligman and Csikszentmihalyi 2000). As a result, we wish to evaluate whether the model from Connell and Wellborn (1991) holds when extended to a positive measure of psychological adjustment. In this study, we will make use of the Dispositional Hope Scale as a measure of positive adjustment.

The Dispositional Hope Scale is part of the field of positive psychology and measures an individual's generalized expectancy for achieving their goals (Snyder et al. 1991). A great deal of research supports the use of hope as a measure of positive psychological adjustment. For example, hope correlates positively with extant measures of adjustment such as self-efficacy, dispositional optimism, self-actualization, and general well-being, and correlates negatively with measures of maladjustment such as depression and anxiety (Magaletta and Oliver 1999; Snyder 1994; Snyder et al. 1991). Hope has been linked to superior coping behaviors in the face of deadly illness (Irving et al. 1998) as well as to lower levels of externalizing behaviors and increased self-worth when dealing with a traumatic accident (Barnum et al. 1998). More generally, research on

stress appraisal in adolescents has found hope to correlate with the propensity to view problems as challenges rather than threats, which then can contribute to the use of more positive coping strategies; further, in these demanding situations, higher-hope individuals tend to have more positive views of the resources available to help them rise to the challenge (Rowley et al. 2005). Hope has also been found to predict task-based coping when controlling for trait positive affect and trait negative affect (Snyder et al. 1991; Steed 2002). Thus, hope represents not only a positive outlook, but also the ability to overcome difficult situations and execute effective coping strategies in times of stress.

In addition to its role as a measure of positive adjustment, the hope construct was also selected for its relevance to the educational environment (see Snyder 2005; Snyder et al. 1999). For example, in school-based research on hope, higher-hope students were found to set more aggressive grade goals for themselves and to retain a positive outlook on future goal attainment despite initial negative feedback (Snyder et al. 1991). In a sample of college freshmen, hope predicted grade-point averages over and above entrance exam scores, and higher-hope students were more likely to graduate (Snyder et al. 2002).

Given these empirical findings, hope can be viewed as a measure of positive adjustment that is highly relevant to the educational milieu. Hope not only contributes to higher levels of achievement but also can help students to cope more effectively with the vicissitudes of adolescence that can interfere with functioning both inside and outside of school. As a result, the promotion of hope among students, and the investigation of the factors that contribute to this promotion, could have immediate benefits for secondary schools.

Peer-related Belongingness in School

In addition to investigating the impact of autonomy and belongingness in school on student adjustment (i.e., hope), and evaluating the ability of engagement to mediate these effects, we also seek to determine whether engagement can fully mediate the effect of peer-related belongingness (i.e., peer support) on student adjustment. In doing so, we are guided in part by findings from Roeser and Eccles (1998), who documented a decrease in academic adjustment as students progressed from 7th to 8th grade while at the same time finding that student self-esteem *increased* during this same period. In addressing this apparent contradiction, the authors hypothesized that factors outside the realm of the learning context, such as friendships, were exerting a strong impact on adolescent mental health during this period. Though their hypothesis is intriguing, Harter (1996) has argued that support and acceptance from the larger peer group, rather than from close friends, has the most

significant impact on adolescent self-esteem throughout the secondary school years. Given this, and recognizing that the consideration of peer effects was initially present in the self-determination theory model (Connell and Wellborn 1991) but has been noticeably absent from much of the more recent research (e.g., Eccles et al. 1997; Roeser and Eccles 1998; Roeser et al. 1998; Skinner and Belmont 1993), this study will include an explicit analysis of the impact of peer belongingness (conceptualized as peer support) on adjustment and will evaluate the ability of engagement to mediate these effects. Given the research cited above, we expect peer support to contribute to academic engagement (e.g., Marks 2000) and, in an unmediated fashion, to psychological adjustment (e.g., Buhrmester 1990).

Finally, research has documented that autonomy, belongingness, and engagement in school are reciprocal in nature, at least with regard to teacher-related measures of belongingness (conceptualized as teacher support and availability). In other words, students' initial perceptions of academic autonomy and teacher-related measures of belongingness can contribute to higher levels of engagement in learning, which in turn can elicit increased support for autonomy and belongingness from teachers (Skinner and Belmont 1993). The existing research does not extend to peer-related measures of belongingness, and examining a reciprocal link between peer-related measures of belongingness and engagement is a further goal of this study.

The Current Study

In sum, the purpose of this study is threefold. First, we will evaluate whether the effects of school-based autonomy and belongingness on positive psychological adjustment (i.e., hope) are mediated by engagement and will pay particularly close attention to peer-related measures of belongingness (i.e., peer support). Second, given that the initial findings were cross-sectional (Connell and Wellborn 1991), we will attempt to extend the relationship between school-based autonomy, belongingness, engagement, and adjustment over time using short-term longitudinal data. Third, we will evaluate whether the reciprocal relationship between autonomy, teacher-related belongingness, and engagement holds when peer-related measures of belongingness are included.

With regard to these goals, four hypotheses are proffered. First, we hypothesize that the relationship between school-based autonomy, belongingness (both teacher and peer support), engagement, and positive psychological adjustment (i.e., hope) will conform to the model introduced by Connell and Wellborn (1991), with engagement in learning serving as the mediator between autonomy/belongingness and hope. Second, we hypothesize that peer-

related belongingness (i.e., peer support) will influence adjustment (i.e., hope) independently of engagement in learning. In other words, although peer-related belongingness is expected to contribute to engagement, we hypothesize that an independent path between peer support and hope will be found. Third, extending this analysis longitudinally, we hypothesize that these relationships will hold over time, with change in engagement and peer support predicting change in hope. Finally, given the research cited above linking peer-related belongingness and engagement (e.g., Marks 2000), we hypothesize that these factors will conform to the reciprocal model introduced by Skinner and Belmont (1993), in which academic autonomy and teacher-related belongingness both influence and are influenced by engagement in learning.

Method

Participants

Participants were 283 students at three small secondary schools in a middle-class rural area in the upper Midwestern United States. Students were recruited directly by the researchers and were offered snacks and gift cards in exchange for their participation. Using a short-term longitudinal format, data were gathered by the researchers or trained assistants in two stages: the first stage was in late November and early December of 2004 (hereafter referred to as “Stage 1”), and the second stage was in late April and early May of 2005 (hereafter referred to as “Stage 2”). The students who participated in Stage 1 were invited to participate in Stage 2, and most elected to do so (231 of 283, or 82%). The students who participated in both stages of the project were not significantly different from the students who elected to participate only in Stage 1, with one exception: students who participated in both stages reported higher engagement in learning, $F(1,264) = 4.88$, $p < .05$. However, the effect size for this difference was small ($\eta^2 = .018$, $\omega^2 = .014$). Overall, the mean age for the students in Stage 1 ($n = 283$) was 15.33 years ($SD = 1.64$) and the sample was 51.9% male ($n = 147$) and 86.2% White ($n = 244$); in Stage 2 ($n = 231$), the mean age was 15.65 years ($SD = 1.70$) and the sample was 52.4% male ($n = 121$) and 88.3% White ($n = 204$).

Measures

Academic Autonomy

This construct was measured with the Academic Self-Regulation Questionnaire, which has been utilized

previously in research on autonomy in school (e.g., Grolnick and Ryan 1989; Grolnick et al. 1991; Patrick et al. 1993; Ryan and Connell 1989). The Academic Self-Regulation Questionnaire assesses students’ self-reported reasons for taking various actions in school (i.e., “Why do I try to do well in school?”). The reasons fall into one of four categories of regulation, ranging along a continuum from external (e.g., “Because that’s what I’m supposed to do”) to introjected (e.g., “Because I’ll feel really bad about myself if I don’t do well”) to identified (e.g., “Because its important to me to do well in school”) to intrinsic (e.g., “Because its fun”). The scale normally consists of 32 items, with eight items for each of the four categories, but in the interest of minimizing the overall length of the questionnaires, a “short form” of 16 items was constructed with the help of one of the scale developers (E. L. Deci, personal communication, October 3, 2004). The shortened scale included only two prompts instead of four (i.e., the items associated with “Why do I work on my classwork?” and “Why do I try to answer hard questions in class?” were not used). As a result, the external and introjected subscales each contained five items, and the identified and intrinsic subscales each contained three items. Small modifications were also introduced in consultation with school staff to account for variation in student learning tasks and adult roles in school (see Table 1). Students responded to each item using a 4-point Likert-type scale from *not at all true* (1) to *very true* (4). As per scale instructions (see Ryan and Connell 1989), the item scores from each of the four subscales were averaged, then weighted according to their relationship with autonomy and summed to create the Relative Autonomy Index (RAI), a measure of students’ perception of autonomy in school.

Data for this scale were gathered during both stages of the project. In Stage 1, the reliability (Cronbach’s alpha) for the data from the extrinsic, introjected, identified and intrinsic subscales was .72, .73, .69, and .79, respectively; in Stage 2, the reliability for the data from the subscales was .72, .70, .67, and .79. These data are equivalent to previously obtained reliability figures (e.g., Grolnick et al. 1991; Ryan and Connell 1989), indicating that the scale alterations did not impact reliability.

Belongingness (Support from Teachers and Peers)

This construct was assessed using several subscales from the Classroom Life Scale, which measure perceptions of support from teachers and peers along both academic and personal dimensions (Johnson et al. 1985). Conceptualizing belongingness in terms of support perceptions is common in research on belongingness in school (e.g., Wentzel 1994, 1997, 1998) and recent work on

Table 1 Revised items for the Academic Self-Regulation Questionnaire (revisions in bold)

Why do I try to do well in school?

Because that's what I'm supposed to do.

So my teachers/**advisor** will think I'm a good student.

Because I enjoy doing my schoolwork/**projects** well.

Because I will get in trouble if I don't do well.

Because I'll feel really bad about myself if I don't do well.

Because it's important to me to try to do well in school.

Because I will feel really proud of myself if I do well.

Because I might get a reward if I do well.

Why do I do my homework **or work on my projects outside of school?**

Because I want the teachers/**advisor** to think I'm a good student.

Because I'll get in trouble if I don't.

Because it's fun.

Because I will feel bad about myself if I don't do it.

Because I want to understand the subject.

Because that's what I'm supposed to do.

Because I enjoy doing my homework **or working on my projects outside of school.**

Because it's important to me to do my homework **or work on my projects outside of school.**

belongingness (e.g., Osterman 2000) treats perceptions of support from teachers and peers as synonymous with belongingness in school.

The Classroom Life Scale contains two teacher-related subscales: teacher personal support (four items, such as "My teachers really care about me") and teacher academic support (four items, such as "My teachers want me to do my best in schoolwork"). There are also two peer-related subscales: peer personal support (four items, such as "In this school, other students care about how much I learn"), and peer academic support (five items, such as "In this school, other students like me the way I am"). Some scale items were originally worded to refer to "in this class" but, given the global nature of our investigation, the items were altered to refer to the school itself; in addition, small modifications were introduced in consultation with school staff to account for variation in adult roles (see Table 2). Students responded to each item using a 5-point Likert-type scale from *never* (1) to *always* (5). Item scores were averaged to obtain subscale scores.

Data for this scale were gathered during both stages of the project. Principal axis factor analysis with Promax rotation revealed a two-factor rather than a four-factor solution, with the two factors corresponding to the combined teacher and peer-related items; in other words, factor analysis did not reveal any differentiation between academic and personal support. Thus, these subscales were combined to yield a total teacher and total peer support

Table 2 Revised items for the Classroom Life Scale (revisions in bold)

Peer personal support subscale

Other students in this **class school** think it is important to be my friend.

In this **class school**, other students like me the way I am.

Other students in this **class school** care about my feelings.

Other students in this **class school** like me as much as they like others.

In this **class school**, other students really care about me.

Peer academic support subscale

Other students in this **class school** want me to do my best schoolwork.

In this **class school**, other students like to help me learn.

In this **class school**, other students care about how much I learn.

Other students in this **class school** want me to come to school every day.

Teacher personal support subscale

My teachers/**advisor** really care(s) about me.

My teachers/**advisor** think(s) it is important to be my friend.

My teachers/**advisor** like(s) me as much as he/she/**they** like(s) other students.

My teachers/**advisor** care(s) about my feelings.

Teacher academic support subscale

My teachers/**advisor** care(s) about how much I learn.

My teachers/**advisor** like(s) to see my work.

My teachers/**advisor** like(s) to help me learn.

My teachers/**advisor** want(s) me to do my best in schoolwork.

score for each student. The teacher and peer support subscales produced reliability (Cronbach's alpha) figures of .90 in Stage 1 and .91 and .92, respectively, in Stage 2. These data are equivalent to previously obtained reliability figures (e.g., Johnson et al. 1985), indicating that the scale alterations did not impact reliability.

Engagement in Learning

This construct was measured using the Engagement vs. Disaffection with Learning Scale (e.g., Furrer and Skinner 2003; Patrick et al. 1993), a 20-item self-report scale that assesses students' level of engagement in classroom activities along two axes: behavioral engagement (i.e., effort and attention) and emotional engagement (i.e., interest and enjoyment). Each of the two subscales contained five positively-worded items and five negatively-worded items. As above, some scale items were originally worded to refer to "in this class" but were altered to refer to the school itself; small changes were also introduced in consultation with school staff to clarify the nature of some items (see Table 3). Students responded using a 4-point Likert-type scale from *not at all true* (1) to *very true* (4).

Table 3 Revised items for the engagement vs. Disaffection in school questionnaire (revisions in bold)

Emotional engagement subscale

When I'm in ~~class~~ **school**, I feel good.

When we work on something in ~~class~~ **school**, I feel interested.

~~Class~~ **School** is fun.

I enjoy learning new things in ~~class~~ **school**.

When we work on something in ~~class~~ **school**, I get involved.

When we work on something in ~~class~~ **school**, I feel bored.

When I'm in ~~class~~ **school**, I feel worried.

When we work on something in ~~class~~ **school**, I feel discouraged.

~~Class~~ **School** is not all that fun for me.

When I'm in ~~class~~ **school**, I feel bad.

Behavioral engagement subscale

I try hard to do well in school.

In ~~class~~ **school**, I work as hard as I can.

When I'm in ~~class~~ **school**, I participate in ~~class~~ discussions **with my classmates and teachers/advisor**.

I pay attention ~~in class~~ **to my teachers/advisor in school**.

When I'm in ~~class~~ **school**, I listen very carefully **to my teachers/advisor**.

When I'm in ~~class~~ **school**, I just act like I'm working.

I don't try very hard at school.

In ~~class~~ **school**, I do just enough to get by.

When I'm in ~~class~~ **school**, I think about other things.

When I'm in ~~class~~ **school**, my mind wanders.

Item scores are added to obtain subscale scores, with negatively-worded items being subtracted from positively-worded items (see Furrer and Skinner 2003).

Data for this scale were gathered during both stages of the project. Principal axis factor analysis with Promax rotation revealed a single factor, so the behavioral and emotional subscale scores were combined to yield a single engagement score. In both Stage 1 and 2, the overall reliability (Cronbach's alpha) was .90. These data are equivalent to previously obtained reliability figures (e.g., Furrer and Skinner 2003, Patrick et al. 1993), indicating that the scale alterations did not impact reliability.

Positive Psychological Adjustment (Hope)

The Dispositional Hope Scale is a self-report, 12-item scale consisting of two components: an individual's orientation towards their goals (e.g., "I meet the goals that I set for myself"), and the individual's perceived ability to identify workable routes to goal attainment (e.g., "There are lots of ways around any problem"). The two components are "reciprocal, additive, and positively related, although they are not synonymous" (Snyder et al. 1991, p. 571). The two

subscales contain four items each, and students respond to each item using an 8-point Likert-type scale from *definitely false* (1) to *definitely true* (8). The scale also contains four filler items that do not belong to either subscale; these items are included to disguise the true nature of the scale and reduce bias in the responses (Snyder et al. 1991). No modifications to scale items were necessary. Per scale instructions (see Snyder et al. 1991), item scores are summed to create subscale scores, which are then added to create the total score.

Data for this scale were gathered during both stages of the project. Principal axis factor analysis with Promax rotation confirmed that engagement and hope are distinct constructs. Data from Stage 1 produced a reliability (Cronbach's alpha) figure of .79 for the total scale, while Stage 2 produced a figure of .77, which is equivalent to previous research (e.g., Snyder et al. 1991).

Analytic Procedures

To test our hypotheses, we used structural equation modeling (SEM). The model representing our first hypothesis was fitted to the data, and we also fitted a model without the hypothesized direct link between peer support and hope, which is identical to the model proposed by Connell and Wellborn (1991). We also constructed models to examine whether the hypothesized model holds over time and to determine whether the variables demonstrate reciprocal relationships.

Standard measures of fit are reported, including the chi-square value (χ^2), the comparative fit index (CFI), the non-normed fit index or Tucker-Lewis Index (TLI), and the root-mean squared error of approximation (RMSEA). Typically, CFI values greater than .95, TLI values greater than .90, and a non-significant χ^2 or a ratio of χ^2 to *df* less than 3.0 are considered to be indicative of adequate fit (Bentler 1990; Bentler and Bonett 1980; Bollen 1989; Cole 1987). With regards to RMSEA, values less than .06 are typically considered indicative of good fit, while values between .06 and .10 are considered adequate fit (Hu and Bentler 1999; Kaplan 2000). In this study, however, we will also be guided by the 90% confidence interval for the RMSEA statistic, which can be more accurate than a single "point" estimate (MacCallum et al. 1996). In this approach, a RMSEA confidence interval that falls *completely below* .05 is considered indicative of close fit, while a confidence interval *containing* .05 is considered adequate fit. For each model tested below, predictors were allowed to correlate freely and the effects of the school and student covariates (i.e., age, gender, race, SES, previous school experience, and school seniority) were controlled.

Results

Descriptive Statistics

The means and standard deviations for each measure are presented in Table 4. Bivariate correlations between measures are presented in Table 5. The correlations in Table 5 include data from both Stage 1 and 2 but are limited to only those students who participated in both stages of the study. An alpha level of .05 was used for all tests of significance. In general, measures of academic autonomy and belongingness in school show significant correlation with engagement and hope.

Analyses

Our initial step was to fit the hypothesized model to the data (all data from Stage 1). The model demonstrated adequate fit, $\chi^2(2, N = 231) = 4.38, p = .11, CFI = .99, TLI = .92, RMSEA = .07 (.001.17)$ and is presented in Fig. 1. All paths were significant at $p < .001$, with the exception of the direct path between peer support and hope, which was significant at $p < .05$. The predictors explained 51% of the variance in engagement in learning and 35% of the variance in hope. An alternative model was fitted without a direct path between peer support and hope, and this model was found to have inferior fit when compared to the hypothesized model, $\chi^2(3, N = 231) = 8.84, p < .05, CFI = .98, TLI = .86, RMSEA = .09 (.021.17)$. The difference in the chi-square values for the two models is significant ($8.84 - 4.38 = 4.46, df = 3 - 2 = 1, p < .05$), indicating that the model with the direct path between peer support and hope demonstrated a significantly better fit.

To examine whether this model holds over time, we extended the model to include data from Stage 2. Given that engagement in learning and peer support predicted hope as described above, we included these measures as well as hope at Stage 2. Stage 1 variables were retained as controls. Engagement and peer support from both Stage 1 and Stage 2 were used to predict hope at Stage 2, although the Stage 1 predictors did not achieve significance and thus

are displayed using dashed lines. The resulting model demonstrates that the relationship between engagement, peer support and hope holds over time even when previous levels of the constructs are controlled. In other words, change in engagement and peer support from Stage 1 to Stage 2 predicted change in hope from Stage 1 to Stage 2. The model demonstrated adequate fit, $\chi^2(12, N = 231) = 24.42, p = .02, \chi^2/df = 2.04, CFI = .99, TLI = .92, RMSEA = .07 (.031.11)$, and is presented in Fig. 2. The predictors explained 47% of the variance in hope at Stage 2.

When exploring the reciprocal effects of academic autonomy, teacher/peer support, and engagement in learning, we discovered that engagement in learning at Stage 1 predicts positive change in student perceptions of autonomy and teacher support between Stage 1 and Stage 2. On the other hand, engagement did not predict change in perceptions of peer support and thus this link is displayed using a dashed line. The model documenting the reciprocal relationship (or lack thereof) among academic autonomy, teacher/peer support, and engagement in learning demonstrated adequate fit, $\chi^2(9, N = 231) = 26.49, p = .002, \chi^2/df = 2.94, CFI = .97, TLI = .91, RMSEA = .09 (.051.11)$, and is presented in Fig. 3. At Stage 2, the predictors explained 45% of the variance in teacher support and 49% of the variance in academic autonomy.

Discussion

In this study, students' perceptions of academic autonomy and both teacher- and peer-related belongingness (i.e., support) in school were each found to have an independent, positive effect on engagement in learning, which in turn has a positive impact on adjustment (i.e., hope). These results confirm the hypothesis that engagement acts as a mediator between autonomy, teacher- and peer-related support and hope. In addition, evidence was found for a direct link between perceptions of peer support and hope that is not mediated by engagement in learning (see Fig. 1). These findings support the model introduced by Connell and Wellborn (1991) with regards to a positive measure of psychological adjustment (i.e., hope) while also providing support for the hypothesis that positive peer relations can impact adjustment independently of the mediating effect of engagement.

The association between engagement in learning, peer support and hope was also found to hold over a 5-month period (see Fig. 2). Even though the common variance among the Stage 1 scores for peer support, engagement and hope was controlled, peer support and engagement each still accounted for a statistically significant amount of variance in hope at Stage 2. In other words, peer support, engagement, and hope not only correlate at a fixed time

Table 4 Means and standard deviations for all variables

| Variables | Stage 1 | | | Stage 2 | | |
|-----------------|---------|-------|------|---------|-------|------|
| | N | M | SD | N | M | SD |
| Autonomy | 277 | .32 | 2.39 | 227 | .53 | 2.44 |
| Teacher support | 270 | 4.09 | .75 | 229 | 4.10 | .69 |
| Peer support | 269 | 3.22 | .79 | 229 | 3.31 | .76 |
| Engagement | 266 | 9.69 | 9.50 | 228 | 7.68 | 9.17 |
| Hope | 277 | 48.03 | 7.13 | 230 | 49.46 | 7.11 |

Table 5 Bivariate correlations for those students in both stages ($N = 231$)

| Variables | Stage | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------|-------|--------|------|--------|--------|--------|--------|--------|--------|--------|
| 1. Autonomy | S1 | .66*** | .17* | .16* | .17* | .18** | .50*** | .44*** | .34*** | .26*** |
| 2. Autonomy | S2 | – | .14* | .19** | .21** | .23** | .47*** | .54*** | .33** | .30*** |
| 3. Teacher support | S1 | – | – | .62*** | .45*** | .36*** | .50*** | .32*** | .21** | .22** |
| 4. Teacher support | S2 | – | – | – | .34*** | .44*** | .45*** | .49*** | .17* | .27*** |
| 5. Peer support | S1 | – | – | – | – | .69*** | .54*** | .42*** | .38*** | .35*** |
| 6. Peer support | S2 | – | – | – | – | – | .45*** | .55*** | .28*** | .36*** |
| 7. Engagement | S1 | – | – | – | – | – | – | .75*** | .52*** | .38*** |
| 8. Engagement | S2 | – | – | – | – | – | – | – | .43*** | .42*** |
| 9. Hope | S1 | – | – | – | – | – | – | – | – | .63*** |
| 10. Hope | S2 | – | – | – | – | – | – | – | – | – |

Note: Pairwise deletion is used. S1 = Stage 1; S2 = Stage 2

* $p < .05$, ** $p < .01$, *** $p < .001$

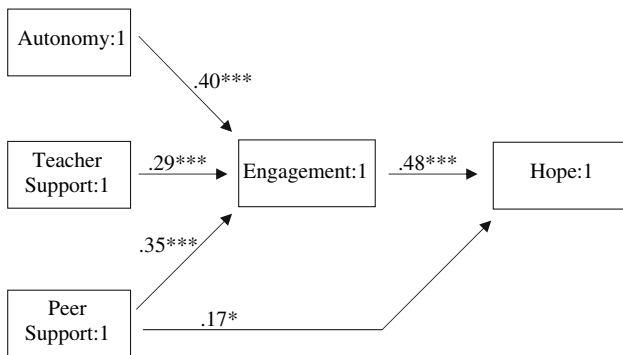


Fig. 1 Hypothesized model linking autonomy, teacher/peer support, engagement and hope. Note: Model contains data from Stage 1 (“:1”) only. Predictors allowed to correlate freely and effects of school and student covariates are controlled (not pictured). Model fit: $\chi^2(2, N = 231) = 4.38, p = .11, CFI = .99, TLI = .92, RMSEA = .07 (.001.17)$. * $p < .05$, *** $p < .001$

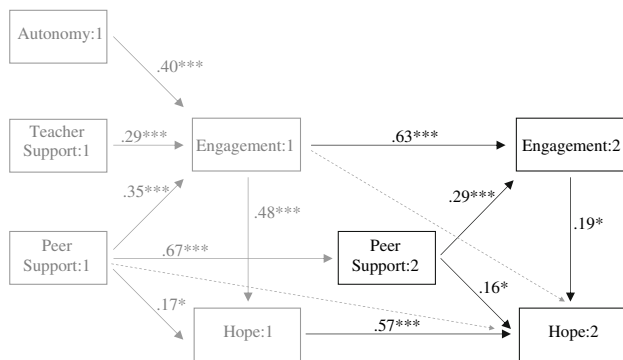


Fig. 2 Hypothesized longitudinal model controlling for previous levels of each construct. Note: Model contains data from both Stage 1 (“:1”) and Stage 2 (“:2”). Paths from peer support/engagement at Stage 1 to hope at Stage 2 are non-significant. Predictors allowed to correlate freely and effects of school and student covariates are controlled (not pictured). Model fit: $\chi^2(12, N = 231) = 24.42, p = .02, \chi^2/df = 2.04, CFI = .99, TLI = .92, RMSEA = .07 (.031.11)$. * $p < .05$, *** $p < .001$

point but also covary over time. Our model implies that peer support and engagement influence hope over time rather than vice versa, but a reciprocal relationship may also be at work. This possibility could be investigated in future research.

In addition to corroborating our hypotheses regarding the relations among academic autonomy, belongingness in school, engagement in learning, and hope, our findings also illustrate a key distinction between engagement and hope. Engagement is a situational or “state” variable and thus is responsive to changes in context (Fredricks et al. 2004). In contrast, hope is a dispositional or “trait” variable and tends to be consistent across time and setting in the absence of unusually positive or negative experiences (Snyder et al. 1991). Consequently, one would expect cross-sectional data to explain a sizeable amount of the variance in engagement but less of the variance in hope. On the other

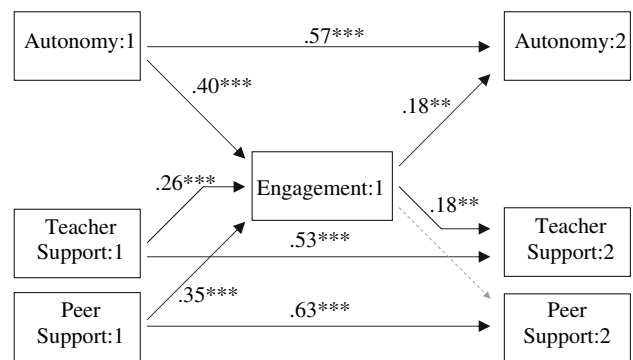


Fig. 3 Reciprocal effects between autonomy, teacher/peer support and engagement. Note: Model contains data from both Stage 1 (“:1”) and Stage 2 (“:2”). Path from engagement at Stage 1 to peer support at Stage 2 is non-significant. Predictors allowed to correlate freely and effects of school and student covariates are controlled (not pictured). Model fit: $\chi^2(9, N = 231) = 26.49, p = .002, \chi^2/df = 2.94, CFI = .97, TLI = .91, RMSEA = .09 (.051.11)$. ** $p < .01$, *** $p < .001$

hand, when predicting changes in hope over time, one would expect greater levels of explained variance in hope. A brief review of our results demonstrates that these expectations were met. The single-stage model (Fig. 1) explained a great deal of the variance in engagement (51%), but somewhat less of the variance in hope (35%), while the two-stage model (Fig. 2) accounted for a greater percentage of the variance in hope (47%). This distinction between engagement and hope could have important implications for school reform efforts, in that changes in the school environment may create relatively immediate changes in student engagement, while changes in hope may develop more slowly.

The links found in the third and final model (Fig. 3) are consistent with the model proposed by Skinner and Belmont (1993), in which engagement in learning was found to influence student perceptions of academic autonomy and teacher-related belongingness. In our analysis, no reciprocal relationship was found between engagement in learning and peer support, which was contrary to our hypothesis. This latter finding, when considered alongside the evidence for an independent, direct relationship between peer support and hope as explicated above, suggests that the effects of peer support in school may be multi-faceted, in which peer factors such as modeling and socialization contribute to engagement in learning, while other factors such as peer regard and acceptance influence psychological adjustment and self-esteem. Future research assessing the various peer factors simultaneously could contribute to untangling these effects. Interestingly, previous research has generally overlooked peer support and has focused solely on teacher-related measures of belongingness (e.g., Eccles et al. 1993; Feldlaufer et al. 1988; Midgley et al. 1989; Roeser et al. 1996; Roeser and Eccles 1998). The results presented here suggest that incorporating peer support into future research efforts may provide a more complete picture of the school environment and yield important new findings.

Future research along these lines could also include “competence”, a construct that self-determination theory posits as critical to adolescents alongside academic autonomy and belongingness in school (Connell and Wellborn 1991; Deci and Ryan 2000). The ability of an educational environment to support a sense of competence has been conceptualized in the literature as a sense of perceived control among students (e.g., Connell and Wellborn 1991) and as the students’ perceived goal orientation of the school (e.g., Roeser et al. 1998). Both constructs have been shown to impact students’ motivation, achievement, and adjustment (Connell and Wellborn 1991; Kaplan and Maehr 1999; Patrick et al. 1993; Roeser et al. 1996; Roeser et al. 1998; Skinner et al. 1990). Inclusion of competence in future research efforts, as with peer-related

measures of belongingness, would undoubtedly provide a more complete picture of the school environment.

In sum, our results suggest that engagement in learning and positive peer relations are independent factors that can each promote higher levels of hope in school. As discussed above, both engagement and hope have been linked to higher levels of academic achievement (Connell and Wellborn 1991; Fredricks et al. 2004; Snyder et al. 1991, 1999, 2002). Thus, an increased focus on student perceptions of academic autonomy and *both* teacher- and peer-related belongingness in school would seem to be warranted in future school reform efforts aimed at raising student achievement. Such developmentally-focused interventions do exist (e.g., Maehr and Midgley 1996) but are not widely utilized.

Limitations

Firstly, with regards to the validity of our findings, we note that our research was limited to middle-class, overwhelmingly White secondary school students in the rural Midwest. This limitation impacts the generalizability of our results and thus the extension of our findings to more diverse samples is warranted. In addition, the attrition between Stages 1 and 2 may have introduced an unknown amount of bias. However, as noted above, the students in the two stages were only different in terms of engagement in learning, and this effect was quite small. As a result, it is unlikely that our results are significantly biased and we contend that this limitation does not appreciably impact internal validity.

Secondly, the data were based entirely upon self-report measures, and therefore some portion of the relationship between the variables may be due to shared-method variance. This issue is present in much of the research in this area; in fact, the bulk of the studies cited above use self-report measures for much, if not all, of their data collection. Insofar as it is exceedingly difficult to measure individuals’ perceptions of academic autonomy and belongingness in school from an objective viewpoint, it is unlikely that this issue will disappear from the field anytime soon. Indeed, at least with regards to belongingness, researchers emphasize the importance of the *perceptions of the individual* in evaluating whether social contact is supportive (Cohen and Willis 1985; Dakof and Taylor 1990; Sarason et al. 1990). Further, *self-reported* perceptions of support appear to be a stronger correlate of health and well-being than objective ratings of support received (Lakey and Heller 1988; Wethington and Kessler 1986). Nevertheless, future research could include measures of the size and/or complexity of peer networks as surrogates for belongingness in school, or could involve the

development of an observational or teacher-report measure of academic autonomy. The development of such measures and the concomitant effort required to establish their validity in the educational context would represent a methodological step forward in self-determination theory research.

Finally, it should also be noted that structural equation modeling is correlational in nature and thus does not necessarily prove causation. However, our findings provide strong evidence for the temporal and reciprocal relations among academic autonomy, belongingness in school, engagement in learning and psychological adjustment, and these results correspond to the extant literature relating these constructs. In addition, our analyses control for a variety of variables that could be expected to influence the results, which also adds weight to our findings.

Conclusion

This study adds to the literature in several ways. Primarily, it extends existing research on self-determination theory by documenting a mechanism by which students' perceptions of academic autonomy and belongingness in school can exert an influence on students' psychological adjustment (i.e., hope). In short, those students who believe their environment to be more supportive of their needs tend to be more engaged in their learning, and, in turn, this process of active engagement promotes students' hope. In addition, our results imply that school-based reforms targeting academic autonomy and belongingness may yield more immediate results for student engagement, while changes in student hope may require a more extended timeframe. Finally, our results confirm that higher levels of engagement in learning contribute to increases in perceptions of academic autonomy and teacher-related support over time, which can create a positive feedback loop.

Our findings document mechanisms by which secondary schools can, both directly and indirectly, contribute to positive student adjustment. Schools cannot only provide more academic autonomy and strive to create more supportive teacher-student relationships, but can also foster greater peer-related belongingness through the implementation of reforms aimed at improving peer relations (e.g., cooperative learning, conflict resolution, peer tutoring, etc.). This should be seen as an intriguing opportunity for schools, given that hope has been linked to superior academic achievement (Snyder et al. 1991, 1999; 2002). Indeed, as discussed above, the field of positive psychology emphasizes the importance of positive psychological adjustment and calls for the creation of climates, such as schools, that foster this sort of positive development

(Seligman and Csikszentmihalyi 2000). The field of positive youth development also recognizes the benefits of promoting "wellness", or positive adjustment; like positive psychology, this field acknowledges the status of education as a "powerful, but not yet well-harnessed force for advancing wellness" (Cowen 1991, p. 405), and calls for the creation of educational environments that promote healthy psychological development (Cowen 1994; Hawkins and Catalano 1990; Zaslow and Takanishi 1993). Our results document a mechanism by which schools could "...transmit knowledge but do so in ways calibrated to advance wellness" (Cowen 1991, p. 405). We agree with Cowen's (1991) assertion that "education's potential, in this regard, has not yet been sufficiently plumbed" (p. 405).

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