

Predicting achievement, distress, and retention among lower-income Latino youth

Wendy Close^{a,*}, Scott Solberg^{b,*}

^a *Wisconsin Lutheran College, Psychology Department, 8800 West Bluemound Road, Milwaukee, WI 53226, USA*

^b *University of Wisconsin-Milwaukee, P.O. Box 413, Enderis Hall 385, Milwaukee, WI 53201, USA*

Received 24 April 2007

Available online 1 September 2007

Abstract

This study used structural equation modeling to evaluate whether a combination of social cognitive and self-determination theories [Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall; Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology*, 53, 1024–1037] would effectively predict high school students' distress, achievement, and retention. Participants were 427 predominately Latino youth from an inner-city low-income high school. Results indicated that students who reported feeling connected to teachers and their school reported higher levels of autonomous motivation for attending school. Students reporting higher levels of autonomous motivation for attending school reported more confidence (i.e., self-efficacy) in their academic ability, and performed better academically. In addition, students who reported higher self-efficacy beliefs reported less physical and psychological distress and reported higher levels of achievement. Retention in school was predicted by a combination of achievement and the absence of physical/psychological distress. Implications for practice and further research on urban high school students' academic development are described.

© 2007 Elsevier Inc. All rights reserved.

Keywords: Social cognitive theory; Self-determination theory; Self-efficacy; Autonomous motivation; Academic achievement; Retention; Latino high school students; Academic adjustment

1. Introduction

Identifying psychological factors that impact academic outcomes is especially critical for low-income and ethnically diverse youth who face a myriad of social and economic barriers (Lerner, 1995; McLoyd, 1998). Recent statistics indicate that students living in low-income families are four times more likely to drop out of high school (National Center for Educational Statistics, 2004). Further, dropout levels are particularly problematic for Latino youth. In 2003, the dropout rate for Latino youth was 24% compared to 10% for all high school students in the United States (National Center for Educational Statistics, 2004). The financial

* Corresponding authors. Address: Center on Education and Work, University of Wisconsin-Madison, 1025 W. Johnson Street, Madison, WI 53706, USA.

E-mail addresses: Wendy.close@wlc.edu (W. Close), ssolberg@education.wisc.edu (S. Solberg).

disparity between those with and without a high school diploma is striking. Today, in the United States, the unemployment rate for high school dropouts is twice the rate of high school graduates and the median income for high school dropouts remains at poverty level (National Center for Educational Statistics, 2004). This gap only continues to drastically widen when examining the incomes of high school dropouts as compared to college graduates. Adults with a 4-year college degree earn a median income of \$41,800, while those who do not graduate from high school earn a median income of \$18,300 (U.S. Census Bureau., 2005).

This study investigated the degree to which three critical student outcomes—academic achievement, psychological/physical distress, and retention could be predicted from constructs derived from two theoretical perspectives—self-determination theory (Ryan & Deci, 2000) and social cognitive theory (Bandura, 1986, 1989, 1997). According to self-determination theory, autonomous motivation will be associated with positive academic outcomes and well-being, while controlled motivation will be associated with less academic engagement and distress (Deci & Ryan, 1987; Ryan & Deci, 2000). Autonomous motivation occurs when one freely chooses to engage in a behavior and fully endorses this choice either out of interest or personal importance. Controlled motivation occurs when a person engages in a behavior because of coercive forces, such as guilt or external pressure. Autonomous motivation has been associated with higher levels of perceived competence, higher academic achievement, and positive affective states (Black & Deci, 2000; Hadre & Reeve, 2003; Ryan & Connell, 1989; Walls & Little, 2005). Alternatively, controlled motivation has been linked to lower academic performance and negative affect (Black & Deci, 2000; Patrick, Skinner, & Connell, 1993; Vallerand, Fortier, & Guay, 1997; Walls & Little, 2005).

Relatedness is a central variable that has been proposed to facilitate students' development of autonomous versus controlled motivation (Deci & Ryan, 1987). Relatedness encompasses the quality of the interpersonal relationship that exists between the teacher and the student, and it refers to the student's sense of belongingness and support. According to self-determination theory, when students feel connected to and involved with teachers, they are less likely to feel controlled and are more likely to display autonomous reasons for engaging in academic activities. While, few studies have examined this proposition, Ryan, Stiller, and Lynch (1994) found that youth who felt connected to and cared for by their teachers were more likely to report autonomous reasons for engaging in positive school-related behaviors.

According to social cognitive theory (Bandura, 1986, 1989, 1997), positive academic outcomes result in large part by the student's level of academic self-efficacy. Defined as one's confidence to successfully execute or perform a specific school-related activities, research has consistently found that higher levels of self-efficacy are associated with higher levels of achievement (Chemers, Hu, & Garcia, 2001; Multon, Brown, & Lent, 1991; Torres & Solberg, 2001). Furthermore, students reporting higher levels of academic self-efficacy also report lower levels of psychological/physical distress (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999; Miserandino, 1996; Quimby & O'Brien, 2004).

This study extends upon previous literature in a number of ways. First, there has been relatively little effort to examine whether it is possible to integrate constructs derived from self-determination and social cognitive theory into a model predicting successful academic transitions. In a recent study, Solberg, Carlstrom, Howard, and Jones (2007) found that meaningful at-risk clusters could be established using a combination of variables derived from self-determination and social cognitive theories and that different levels of risk were associated with different health and academic outcomes. Second, this study also extends previous research by including two additional variables (relatedness and distress) which have not been included in any previous high school transition models. Including relatedness has important implications for classroom intervention, while the inclusion of distress allows for examining this important construct in relation to both achievement and retention. And finally, while previous research has relied upon self-report indicators of achievement and retention, this model includes actual grades received at the end of the semester and attendance rates as an indicator of achievement. Retention was defined as whether the student received an end of semester grade report.

Fig. 1 presents the proposed model. The proposed model posits that, consistent with self-determination theory, relatedness is expected to directly influence both autonomous motivation and controlled motivation, with relatedness being positively correlated with autonomous motivation and negatively correlated with controlled motivation (Ryan & Powelson, 1991; Ryan, Stiller, et al., 1994). Second, it is proposed that both autonomous motivation and controlled motivation will directly influence levels of self-efficacy, achievement, and distress. Specifically, autonomous motivation will be positively correlated with self-efficacy and achievement and

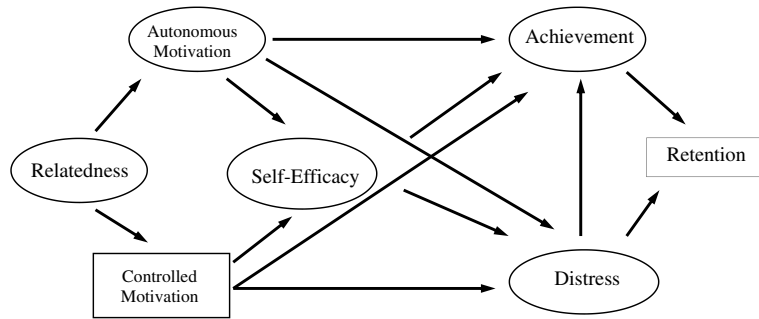


Fig. 1. Proposed model. Relatedness refers to connections with teachers and peers. Autonomous motivation refers to intrinsic and identified motivation. Controlled motivation refers to external regulation. Self-efficacy refers social and academic self-efficacy. Achievement refers to grade point average and attendance. Distress refers to agitation, sleep difficulties, eating difficulties, and depression. Retention refers to whether the student received a grade report at the end of the term.

negatively correlated with distress, while controlled motivation will be negatively correlated with self-efficacy and achievement and positively correlated with distress (Black & Deci, 2000; Patrick et al., 1993). Third, higher levels of self-efficacy will positively influence levels of achievement (Chemers et al., 2001; Multon et al., 1991) and negatively influence levels of distress (Miserandino, 1996; Torres & Solberg, 2001). Finally, it is predicted that levels of distress will influence achievement (Hysenbegasi, Hass, & Rowland, 2005; Liu, Kaplan, & Risser, 1992) and that both achievement and distress will influence retention (Franklin & Streeter, 1996; Newcomb et al., 2002; Stearns & Glennie, 2006).

2. Methods

2.1. Participants

Participants included 427 ethnically diverse ninth-grade (52%) and tenth-grade (48%) high school students attending a central city high school in the Midwest. The sample consisted of 233 females and 192 males. Self-reported ethnic representation of students was primarily from two minority groups: 72% Latino, 13% African American, 5% Asian American, 5% Caucasian, 2% Native American, and the other 3% described themselves as other. The overall dropout rate for the school, as reported by the metropolitan school district, is 49% and low-income students (measured as those receiving free meals) represent 78% of the school population. A profile of the school's students indicates that 90% of the students are below the national average on standardized achievement test scores for reading, 79% below the national average for mathematics, and 82% below the national average for language performance.

2.2. Procedure

This study was conducted as part of a larger intervention study. Students completed a survey designed to assess demographic information, autonomy, control, relatedness, academic self-efficacy, and physical/psychological distress. Surveys were administered in classrooms using standardized instructions during regular class times by trained experimenters and teachers. Participation was voluntary, and students received individualized reports as part of the larger intervention program (Solberg, Close, & Metz, 2000). Staff were available throughout the class time to answer questions. On the average, students took about 50 min to complete their surveys.

2.3. Measures

2.3.1. Self-efficacy

The Class Self-Confidence and Social Self-Confidence subscales of the High School Academic Self-Efficacy Inventory (Solberg, 1999) were used as two separate indicators for the latent variable self-efficacy. The High

School Self-Efficacy Inventory consists of 22 items measuring one's confidence for performing various tasks associated with high school success. Sample items include "Taking good notes in class," "Asking a question in class," and "Making new friends at school." Each item is phrased to follow the general statement: "How confident are you that you could successfully complete the following tasks?" Items are rated on an eight-point scale ranging from 0 (*totally unconfident*) to 7 (*totally confident*).

Evidence for construct validity was provided by Solberg et al. (1998) and consisted of a principal components analysis of the items, which yielded four-factors with loadings greater than 1.0 and accounted for 64% of the total variance. Four, three and two-factor solutions were generated and the two-factor solution was found to be the most meaningful. Factor 1 consisted of eight items with loadings ranging from .80 ("Keeping up to date on homework") to .58 ("Relaxing during a test"). Because all items addressed issues relating to academics, the subscale was entitled Class Self-Confidence. Factor two consisted of 10 items with loadings ranging from .70 ("Participating in class discussions") to .51 ("Working on a group class project"). All items on this factor addressed social situations and was entitled Social Self-Confidence. Internal consistency estimates were used to establish reliability, and coefficient alpha estimates were .92 for the total scale and .88 and .84 for the subscales.

2.3.2. *Autonomous and controlled motivation*

An adapted version the Academic Self-Regulation Questionnaire (Ryan & Connell, 1989) was used to measure one's reasons for attending school regularly. This questionnaire asks the respondent to report how true, using a five-point Likert type scale ranging from 0 (*very much untrue*) to 4 (*very much true*), each reason listed for attending school is for them. All 15 items are phrased to follow the general statement: "The reason I keep coming to school is. . . .". The reasons reflect various styles of extrinsic regulation (e.g., "because if I don't I'll get punished"), introjected regulation (e.g., "so important people in my life won't be disappointed in me"), identified regulation (e.g., "because education is important to the goals I have"), and intrinsic motivation (e.g., "because I really enjoy school").

This instrument was submitted to confirmatory factor analytic procedures (Close, 2000) using the LISREL 8 program to investigate four competing hypothetical structures: a one-factor model, a two-factor internal/external PLOC model, a four-factor model (i.e., intrinsic motivation, identified regulation, introjected regulation, and external regulation), and a second-order two-factor model). Results indicated that the second-order two-factor structure provided the best fit ($\chi^2 = 71, 132.29$, GFI = 93, and RMSEA = 06) and supported two higher-order general factors of autonomy and control and four lower-order factors corresponding to intrinsic motivation, identified regulation, introjected regulation, and external regulation. External regulation and introjected regulation loaded on the control factor and identified regulation and intrinsic motivation loaded on the autonomy factor. These results lend support for self-determination's (Ryan & Connell, 1989) contention that there are four distinct qualities of motivation and that the intrinsic and integrated scales are autonomous forms, while the externally regulated and introjected scales are controlled forms.

For the purpose of this study, the intrinsic and identified subscales were used as two separate indicators for the latent variable autonomous motivation. While, it was planned that the external and introjected subscales would serve as two separate indicators for the latent variable controlled motivation, results from the measurement model indicated that both factors together failed to load substantively on the control factor, with the introjected subscale loading indiscriminately across subscales (see Section 3 for details). For this reason, the external subscale was used as the only indicator for the latent variable controlled motivation.

2.3.3. *Relatedness*

Relatedness was assessed with a 10-item measure designed to assess one's connection to teachers and peers at school. This instrument was originally developed for college students (Pascarella & Terenzini, 1980). For the purpose of this study, a version revised for use with high school students was used (in the revised measure, some items were reworded, i.e., the word "faculty" was changed to "teacher", "institution" to "school"). Sample items include: "Teachers here care about their students" and "I have friends here at this school." Items are rated on a five-point scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*).

Solberg (1999) conducted a principal components analysis on this measure and results revealed two interpretable factors with eigenvalue loadings greater than 1.0 that accounted for 54% of the variance. Factor 1

consisted of five items with loadings ranging from .85 (“Teachers here are interested in my success”) to .65 (“There is a teacher here that I can go see to talk about academic problems”). Because all items addressed issues of connection to teachers, the subscale was titled Connection to Teachers. Factor 2 consisted of four items with loadings ranging from .82 (“I am glad I am at this school”) to .59 (“I take part in school activities”). Because all items addressed issues of connection to school, the subscale was titled Connection to School. Alpha coefficients for the individual subscales were .84 and .75. For the purpose of this study, the Connection to Teachers and Connection to School subscales were used as two separate indicators for the latent variable relatedness.

2.3.4. *Distress*

An adapted version of the College Distress Inventory (Ryan, Hanin, & Solberg, 1994) was used to assess physical and psychological distress. In the adapted version, some words were reworded for high school students’ comprehension. This inventory asks participants to “Indicate how often you have experienced each of the following?” Nineteen items are rated on a six-point scale ranging from *never* to *always*. Sample items include “being tired, but unable to sleep” and “feeling cranky”.

Solberg (1999) submitted the adapted version of the survey for use with high school students to a principal components analysis. Results yielded four factors with eigenvalues over 1 and accounted for 58% of the total variance. Varimax rotation revealed a four-factor solution to be the most meaningful. Factor 1 consisted of eight items with loadings ranging from .71 (“Losing your temper”) to .55 (“Fighting with friends”). All of the items in Factor 1 addressed agitation and were consistent with Ryan, Hanin, et al. (1994) and Ryan, Stiller, et al. (1994) Agitated subscale. Factor 2 consisted of four items with loadings ranging from .81 (“Not sleeping well”) to .68 (“Sleeping less than usual at night”) and was consistent with Ryan, Hanin, et al. (1994) and Ryan, Stiller, et al. (1994) Sleeping Difficulties subscale. Factor 3 consisted of three items with loadings ranging from .82 (“Feeling hopeless”) to .64 (“Feeling depressed”) and was consistent with Ryan, Hanin, et al. (1994) and Ryan, Stiller, et al. (1994) Depression subscale. Factor 4 consisted of three items with loadings ranging from .81 (“Increased appetite”) to .80 (“Snacking more than usual”) and was consistent with Ryan, Hanin, et al. (1994) and Ryan, Stiller, et al. (1994) Eating Difficulties subscale. Three items that had previously made up Ryan, Hanin, et al. (1994) and Ryan, Stiller, et al. (1994) Physical Complaints subscale were dropped because they appeared to load indiscriminately across factors with the high school population. The alpha coefficient for the total scale was .92 and for the subscales the alpha coefficients were .85, .86, .80, and .81, respectively. For the purpose of this study, the Agitated, Sleeping Difficulties, Depression, and Eating Difficulties subscales were reverse coded and used as four separate indicators of the latent variable distress.

2.3.5. *Academic achievement*

Fall grade point average (g.p.a) and percentage of classes attended were used as two indicators of the latent variable academic Achievement. Grade point averages were calculated on a four-point scale, where 4.0 represents an earned grade of an A, 3.0 represents a B, 2.0 represents a C, and 1.0 represents a D. Values for percentage of classes attended could range from 0% to 100% with 100% indicating that a student did not miss any classes during the fall semester.

2.3.6. *Retention*

Retention had only one indicator and thus served as an endogenous manifest variable. It was determined by identifying which students received grades at the end of the academic year and was measured as a dichotomous variable (i.e., 0 = not enrolled, 1 = re-enrolled).

3. Results

The proposed model of high school success was tested using structural equation modeling. A two-step modeling approach was used. According to Joreskog and Sorbom (1993), the model-building tasks can be thought of as the analysis of two conceptually distinct models: the measurement model and the structural model. The measurement model specifies the relations of the observed measures to their hypothesized underlying

constructs. The structural model specifies the causal relations of the constructs to one another, which requires an a priori postulation of model structure that emerges from theory and/or empirical research.

The raw data matrix was prepared using Prelis 2 (Joreskog & Sorbom, 1993b) and indicated that the data met all of the necessary assumptions for structural equation modeling. Table 1 presents the correlation matrix, means, and standard deviation for each observed variable. All other analyses were based on LISREL 8 (Joreskog & Sorbom, 1993a).

Adequacy of measurement and structural model fit was based on the chi-square statistic and three additional indices that are less easily distorted by sample size (Hoyle, 1995): the comparative fit index (CFI), the nonnormed fit index (NNFI), and the standardized root-mean-square residual (SRMR). According to Hoyle (1995), convergence of several criteria of fit increases one's confidence in the viability of the hypothesized model. The CFI and NNFI both take on values between 0 and 1. A perfect fit of the model to the data would be indicated by CFI and NNFI values of 1; values greater than .90 generally indicate a good fit to the data (Schumacker & Lomax, 1996). The SRMR is a measure of the average discrepancy between the elements in the observed and hypothesized covariance matrices. SRMR values less than .05 generally indicate a good fit to the data (Schumacker & Lomax, 1996).

3.1. Measurement model

Confirmatory factor analysis was used to estimate the fit of the measurement model (i.e., how well the observed indicators measured the latent constructs of interest). Multiple indicators were used for six of the seven constructs in the model. The latent constructs and their measured indicators were as follows: scores for class efficacy and social efficacy were freely estimated indicators of a self-efficacy factor; scores for teacher connection and school connection subscales were freely estimated indicators of a relatedness factor; scores for agitation, sleep, depression, and eating difficulties were freely estimated indicators of a distress factor; scores for intrinsic and identified subscales were freely estimated indicators of an autonomy factor; scores for introjected and external regulation were freely estimated indicators of a control factor; and g.p.a. and percentage of classes missed were freely estimated indicators of an achievement factor. Loadings of the single indicator of retention was fixed to 1. Factor covariances were freed to be estimated.

While fit statistics for this measurement model (Model 1) were adequate, the introjected and extrinsic indicators did not load substantively on their intended hypothesized factor (i.e., controlled motivation). For this reason, the introjected factor was dropped as one of the indicators of controlled motivation and the same

Table 1
Correlation matrix, means, and standard deviations for the 13 observed variables in the motivational model

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Academic confidence	—												
2. Social confidence	.63	—											
3. Intrinsic motivation	.32	.28	—										
4. Identified motivation	.42	.31	.58	—									
5. External regulation	-.05	-.01	.05	.01	—								
6. GPA	.35	.15	.17	.29	-.18	—							
7. Attendance	.20	.12	.10	.10	-.15	.50	—						
8. Agitation	-.21	-.15	-.13	-.18	.10	-.28	-.13	—					
9. Sleep	-.22	-.12	-.07	-.03	.19	-.20	-.10	.56	—				
10. Depression	-.19	-.23	-.10	-.15	.21	-.10	-.06	.52	.51	—			
11. Eating difficulties	-.20	-.04	.03	-.08	.17	-.20	-.10	.50	.42	.35	—		
12. Connection to teachers	.30	.28	.36	.38	-.10	.29	.16	-.20	-.18	-.09	-.09	—	
13. Connection to school	.32	.27	.42	.40	-.04	.23	.12	-.18	-.16	-.13	-.06	.64	—
<i>M</i>	4.96	4.86	2.52	3.82	1.81	1.96	77.03	1.32	1.64	1.31	1.41	2.72	2.52
<i>SD</i>	1.19	1.17	.98	.83	.87	1.14	20.34	.94	1.17	1.11	1.18	.79	.87

Note: $N = 427$. Variables 1–2 are indicators for self-efficacy; variables 3–4 are indicators for autonomous motivation; variable 5 is the only indicator for Controlled Motivation. Variables 6–7 are indicators for achievement; variables 8–11 are indicators for distress; variables 12–13 are indicators for relatedness.

model was run again, but this time with only one indicator for controlled motivation (i.e., extrinsic regulation). Fit statistics for Measurement Model 2 revealed a better model fit than Model 1 (See Table 2) and each indicator in Model 2 loaded significantly ($p < .001$) and substantively on its hypothesized factor.

3.2. Structural model

The structural model included one exogenous latent variable (i.e., relatedness) and six endogenous variables (i.e., autonomy, control, self-efficacy, achievement, distress, and retention). Results of the structural model revealed that the data fit the model well (See Table 3). As indicated in Fig. 2, 10 of the 13 hypothesized paths were significant. Because the removing of insignificant paths did not have theoretical or empirical support, the model was not modified.

Consistent with self-determination theory (Deci & Ryan, 1987), relatedness directly predicted autonomous motivation ($\beta = .66$). However, a direct negative relationship between relatedness and controlled motivation was not found ($\beta = -.06$). As predicted, autonomous motivation directly influenced both self-efficacy ($\beta = .47$) and achievement ($\beta = .22$), while controlled motivation positively predicted distress ($\beta = -.21$) and negatively predicted achievement ($\beta = -.17$). However, unlike predicted, autonomous motivation did

Table 2
Summary of fit indices for measurement Model 1 and 2

Model	CFI	NNFI	SRMR	χ^2	df
Model 1	.93	.90	.06	206.40	70
Model 2	.94	.91	.04	161.75	58

$N = 427$. Note: Model 1, two indicators of control (i.e. external regulation and introjected regulation). Model 2, one indicator of Control (i.e. extrinsic regulation). CFI, comparative fit index; NNFI, nonnormed fit index; SRMR, standardized root-mean-square residual.

Table 3
Summary of fit indices for structural model

Model	CFI	NNFI	SRMR	χ^2	df	χ^2/df	$\Delta\chi^2$	Δdf
Overall model	.94	.91	.05	176.17	66	2.67		
Autonomy and distress mediated by self-efficacy								
Direct effects	.88	.85	.11	286.39	68	4.21		
Overall	.94	.92	.05	176.17	66	2.67		
Fully med.	.94	.92	.05	177.49	67	2.65	1.32	1

$N = 427$. Fully med., fully mediated. CFI, comparative fit index; NNFI, nonnormed fit index; SRMR, standardized root-mean-square residual.

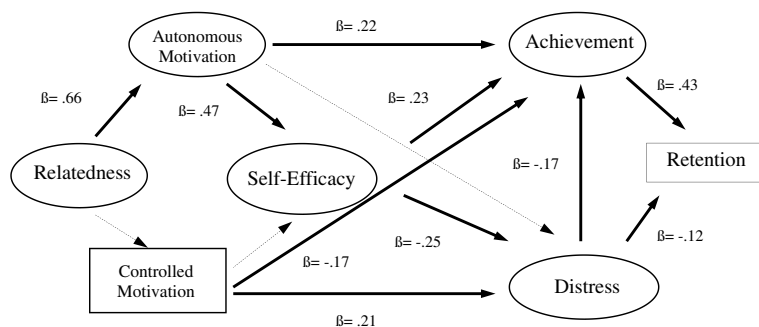


Fig. 2. Final model. Relatedness refers to connections with teachers and peers. Autonomous motivation refers to intrinsic and identified motivation. Controlled motivation refers to external regulation. Self-efficacy refers social and academic self-efficacy. Achievement refers to grade point average and attendance. Distress refers to psychological agitation, sleep difficulties, eating difficulties, and depression. Retention refers to whether the student received a grade report at the end of the term.

not predict distress ($\beta = .08$) and controlled motivation did not negatively predict self-efficacy ($\beta = .05$). Further, as proposed by social cognitive theory (Bandura, 1986), self-efficacy both directly influenced achievement ($\beta = .23$) and negatively influenced distress ($\beta = .25$). And finally, high levels of distress proved to be negatively predictive of achievement ($\beta = .17$), while high levels of achievement ($\beta = .36$) and low levels of distress ($\beta = .15$) led to retention.

3.3. Tests for mediation

One possible explanation for why autonomy was not related to distress is that self-efficacy played a mediating role. According to Holmbeck (1997), three models must be estimated to test for mediation. First, the direct effect model tests the effects of the exogenous factors (i.e., autonomous motivation) on the endogenous factor (i.e., distress) in the absence of the mediator (i.e., self-efficacy). For mediation to exist, the path coefficients in the direct effect model must be significant; thus, there must be a significant effect of autonomous motivation on distress. Results of this first test indicated a significant path coefficient from autonomy to distress ($\beta = .22$).

The second step in Holmbeck's (1997) process for assessing mediation involves testing the overall model. The overall model retains the free path for the direct effect of the exogenous factor on the endogenous factor, and adds paths from the exogenous factor to the mediator and from the mediator to the endogenous factor. If the overall model yields an adequate fit, then further steps are warranted. Results indicated that the overall model yielded an adequate fit (see Table 3). In this model, the path coefficient for the direct effect of autonomous motivation on distress was nonsignificant (.08).

The final step in Holmbeck's (1997) process involves comparing the overall model with the fully mediated model, in which the direct path from the exogenous factor (i.e., autonomous motivation) to the endogenous factor (i.e., distress) is constrained to zero. Results of this test revealed that the fully mediated model provided adequate fit for the data (See Table 3).

To assess whether the overall model or the fully mediated model provided a better fit to the data, the chi-square difference test was performed. The chi-square difference between the overall and the fully mediated model indicated that including the direct path from autonomous motivation to distress in the overall model did not significantly improve the model (see Table 3), suggesting full mediation of the relation of autonomous motivation to distress by self-efficacy.

4. Discussion

This study used confirmatory path analytic techniques to evaluate factors likely to influence the distress, academic achievement, and retention of predominately Latino high school students. The factors used in the model were drawn from social cognitive and self-determination theories (Bandura, 1986; Deci & Ryan, 1987) and the results consistently support the applicability of both models to understanding school success.

First, as predicted, when students reported stronger relatedness (connections to their teachers and peers) they also reported higher levels of autonomous motivation for coming to school. The relationship between relatedness and autonomous motivation is consistent with self-determination theory (Deci & Ryan, 1987) and findings from other studies (e.g., Ryan & Powelson, 1991; Ryan, Stiller, et al., 1994). However, relatedness was not negatively related to controlled motivation. One possible reason for this finding is that past studies that have examined the relatedness-control link have collapsed the autonomous motivation and controlled motivation subscales into one composite score of relative autonomy, whereas we treated autonomy and control as two separate factors (Deci & Ryan, 1987; Ryan & Powelson, 1991; Ryan, Stiller, et al., 1994).

The second set of results confirmed the importance of differentiating between different motivation styles (i.e., controlled and autonomous). Specifically results indicated, as predicted, that students who endorsed autonomous reasons for coming to school reported higher levels of self-efficacy and displayed higher levels of achievement, while students who endorsed attending school for controlled reasons recorded lower achievement and reported higher levels of distress. These findings are consistent with self-determination theory (Deci & Ryan, 1987) and prior findings with students (Ryan & Gronlick, 1986; Vallerand et al., 1997).

However, the data failed to support the prediction that students' level of autonomous motivation would negatively relate to level of distress. Despite prior findings (Patrick et al., 1993; Ryan & Gronlick, 1986) revealing a negative relationship between autonomous motivation and distress, students in this study reporting higher autonomous motivation did not report lower levels of distress. Rather, in this study the relationship between autonomous motivation and distress was fully mediated by academic self-efficacy. While controlled motivation was found to be directly associated with higher distress, autonomous motivation indirectly impacted distress through self-efficacy. In addition, the data failed to support the hypothesis that controlled motivation would negatively influence self-efficacy. Instead, no relationship (neither positive nor negative) was found between controlled motivation and efficacy.

The third set of results found, as predicted, that self-efficacy beliefs were positively predictive of academic achievement and negatively predictive of distress. Specifically, students reporting higher levels of academic confidence earned higher grades, attended school more regularly, and reported less physical and psychological distress. The results relating self-efficacy to achievement are consistent with social cognitive theory (Bandura, 1986) and previous findings (Chemers et al., 2001; Hackett, Casas, Betz, & Rocha-Singh, 1992; Multon et al., 1991; Zimmerman, Bandura, & Martinez-Pons, 1992). The results linking higher self-efficacy with lower levels of distress are consistent with and extend the results of previous studies. While, self-efficacy has been related to distress in studies with college and elementary students (Miserandino, 1996; Torres & Solberg, 2001), the present results are important in that they link self-efficacy to lower levels of distress with a high school population.

And finally, as predicted, higher reported levels of distress were predictive of lower levels of achievement, and both low levels of distress and high levels of academic achievement were related to retention. Specifically, students who recorded higher levels of achievement and reported lower levels of physical/psychological distress were more likely to complete their school term. The results were consistent with previous findings linking both achievement (Cairns, Cairns, & Neckerman, 1989; Newcomb et al., 2002; Stearns & Glennie, 2006) and well-being to retention (Frankling & Streeter, 1996). This finding provides additional support for the assertion that the most effective interventions designed to increase retention rates will be those that include comprehensive services, such as health-care and mental health services (American School Counselor Association., 2003).

4.1. Limitations of the study

Despite using a prospective design, limitations associated with correlational methods do not allow for inferring causal relations between the variables. Also caution is warranted in interpreting the retention variable. Because retention was measured by identifying youth who received report cards at the end of the school year, students who transferred to different schools during the year or who moved back to Mexico cannot be differentiated from students who dropped out of high school. Third, because of the measurement issues involved with the introjected subscale, the control variable has a more limited scope than initially proposed by self-determination theory. And finally, the sample was specific to predominately Latino/a students attending a low-income urban high school and caution should be made when generalizing the results to students from different income levels and different racial/ethnic backgrounds.

4.2. Future research

Several directions for future research deserve mention. First, future studies may want to extend these findings by testing a similar model that also includes outcome expectations. Outcome expectations are a central component of social cognitive theory (Bandura, 1997) and refer to one's perceptions about what kinds of consequences will happen if one engages in a certain behavior. Whereas self-efficacy beliefs are concerned with one's perceived capabilities ("Can I do this?"), outcome expectations entail the perceived consequences of performing given behaviors ("If I do this, what will happen?"). Similar to self-efficacy, outcome expectations are proposed to be central to choice of activities, persistence and effort, as well as actual performance. Including outcome expectations in the model would result in a more complete picture and give an even better understanding of the relationships among and between social cognitive and self-determination variables and academic outcomes.

It would also be useful to devote further attention to the interplay of Bandura's four sources of information and an autonomy supportive environment in relation to self-efficacy and autonomy. Specifically, based on the relationship between autonomy and self-efficacy, it would be interesting to examine whether Bandura's four sources acquired in a controlling context would be as potent as those acquired in an autonomy supportive context.

Future research is also needed to investigate how introjection fits into the conceptualization of control and autonomy. Results have been mixed with some studies suggesting that items developed to measure introjection cross-load on both scales of control and autonomy (Ryan & Connell, 1989), while other studies describe introjection-related items falling clearly under a control factor (Black & Deci, 2000). Thus, the concept of introjection appears very complicated and at this point, there appears to be some confusion as to exactly what we're measuring in terms of autonomy and control.

4.3. Implications

In terms of implications for practice, these present findings suggest that interventions designed to promote both autonomy and self-efficacy may offer useful ways to promote health status, academic achievement, and retention. As demonstrated in this study, facilitating a sense of connection between teachers and students would be one way to promote autonomous motivation. In addition Deci and Ryan (1987) identify the importance of providing an autonomy supportive environment in which teachers acknowledge students' point of view, encourage students' choices and initiatives, and demonstrate why school related tasks are important, valuable, and meaningful when they are not inherently fun. Sadly, research on differential treatment and teacher expectancies of low SES students and urban minority students is well documented and conveys a tendency for many well-intentioned teachers to use extreme teaching styles and act more custodial and set more rules (Alvidrez & Weinstein, 1999; McLoyd, 1998; Trujillo, 1998). Results of this study lend support to the proposition that "getting tough" may actually undermine student's autonomy and result in lower achievement and higher levels of distress.

In relation to facilitating self-efficacy, Bandura (1989) suggests that students obtain information about their self-efficacy from four sources: personal performance accomplishments, vicarious learning, social persuasion, and emotional arousal. For example, students' judgments about their competencies is influenced by their performance. When students fail, their self-efficacy lowers, when they succeed, their efficacy heightens (Campbell & Hackett, 1986; Zimmerman & Ringle, 1981). Similarly, students also acquire efficacy information through watching others similar to them succeed or fail. According to social cognitive theory, when students observe someone who they deem similar to themselves undertaking and succeeding at an activity, they are more likely to have confidence that they too can be successful at this activity (Schunk, 1981). In addition, according to social cognitive theory (Bandura, 1989) the information that students receive, both positive and negative, from parents, teachers, and important others influences whether or not they feel they are capable in a particular area. Students receiving positive persuasive information (e.g. "You can do it") are more likely to feel capable of performing a task. And finally, students also acquire efficacy information from physiological reactions (e.g., heart pounding, sweating). Thus, a student who experiences anxiety symptoms related to performance on a task (i.e., public speaking) may interpret this anxiety as a lack of skill or incompetence. Purposeful intervention programming designed to enhance self-efficacy through incorporating Bandura's four sources of information is especially critical for urban adolescents who are faced with contextual factors that put them at risk for failure experiences, such as lack of academic and career role models in urban communities, limited resources, discrimination, racism, lack of positive feedback, and low teacher expectations (Katz, 1993; McLoyd, 1998).

In sum, these findings generally support the model of high school success that was derived from social-cognitive theory (Bandura, 1986) and self-determination theory (Deci & Ryan, 1987). Specifically, this study highlights the importance of promoting feelings of connections between teachers and students, as well as heightening students' sense of autonomy and self-efficacy in facilitating positive academic outcomes. Strategically designing interventions to promote self-efficacy and autonomy is especially crucial for urban adolescents who because of social, cultural, and economic conditions may be less likely to experience a social context that naturally facilitates self-efficacy and autonomy.

References

- Alvidrez, J., & Weinstein, R. (1999). Early teacher perceptions and later student academic achievement. *Journal of Educational Psychology, 91*, 731–746.
- American School Counselor Association. (2003). *The ASCA national model: A framework for school counseling programs*. Alexandria, VA: Author.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 9*, 1175–1184.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bandura, A., Pastorelli, C., Barbaranelli, C., & Caprara, V. (1999). Self-efficacy pathways to childhood depression. *Journal of Personality and Social Psychology, 76*, 258–269.
- Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination perspective. *Science Education, 84*, 740–756.
- Cairns, R., Cairns, B., & Neckerman, H. (1989). Early school dropout: Configurations and determinants. *Child Development, 60*, 1437–1452.
- Campbell, N., & Hackett, G. (1986). The effects of mathematics task performance on math self-efficacy and task interest. *Journal of Vocational Behavior, 28*, 149–162.
- Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first-year college student performance and adjustment. *Journal of Educational Psychology, 93*(1), 55–64.
- Close, W. (2000). Confirmatory factor analysis of the Academic Self-Regulation Scale. [Unpublished Report].
- Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology, 53*, 1024–1037.
- Franklin, C., & Streeter, C. (1996). Assessment of middle class youth at-risk to dropout: School, psychological, and family correlates. *Children and Youth Services Review, 17*, 433–448.
- Hackett, G., Casas, M., Betz, N., & Rocha-Singh, I. A. (1992). Gender, ethnicity, and social cognitive factors predicting the academic achievement of students in engineering. *Journal of Counseling Psychology, 39*, 527–538.
- Hadre, P. L., & Reeve, J. (2003). A motivational model of rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology, 95*, 347–356.
- Holmbeck, G. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators. *Journal of Counseling and Clinical Psychology, 65*, 599–610.
- Hoyle, R. H. (Ed.). (1995). *Structural equation modeling: Concepts, issues, and applications*. Newbury Park CA: Sage.
- Hysenbegasi, A., Hass, S. L., & Rowland, C. R. (2005). The impact of depression on the academic productivity of university students. *The Journal of Mental Health Policy and Economics, 8*, 145–151.
- Joreskog, K. G., & Sorbom, D. (1993). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.
- Joreskog, K. G., & Sorbom, D. (1993a). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Hillsdale, NJ: Scientific Software International.
- Joreskog, K. G., & Sorbom, D. (1993b). *Preliis Z: A program for multivariate data screening and data summarization: A preprocessor for LISREL*. Chicago, IL: Scientific Software International.
- Katz, M. (1993). *The underclass debate*. Princeton, New Jersey: Princeton University Press.
- Lerner, R. M. (1995). *America's youth in crisis: Challenges and options for programs and policies*. Thousand Oaks, CA: Sage.
- Liu, X., Kaplan, H., & Risser, W. (1992). Decomposing the reciprocal relationships between academic achievement and general self-esteem. *Youth and Society, 24*, 123–148.
- McLoyd, V. (1998). Socioeconomic disadvantage and child development. *American Psychologist, 53*, 185–204.
- Miserandino, M. (1996). Children who do well in school: Individual differences in perceived competence and autonomy in above-average. *Journal of Educational Psychology, 88*, 203–214.
- Multon, K. D., Brown, S., & Lent, R. (1991). Relations of self-efficacy beliefs to academic outcomes: A meta-analytic investigation. *Journal of Counseling Psychology, 38*, 30–38.
- National Center for Educational Statistics. (2004). Retrieved April 14, 2007, from <http://nces.ed.gov/pubs2007/dropout/>.
- Newcomb, M. D., Abbott, R. D., Catalano, R. F., Hawkins, J. D., Battin-Pearson, S., & Hill, K. G. (2002). Mediational and deviance theories of late high school failure: Process roles of structural strains, academic competence, and general versus specific problem behaviors. *Journal of Counseling Psychology, 49*, 172–186.
- Pascarella, E. T., & Terenzini, P. T. (1980). Predicting freshman persistence, involuntary dropout decisions from a theoretical model. *Journal of Higher Education, 48*, 540–552.
- Patrick, B. C., Skinner, E. A., & Connell, J. P. (1993). What motivates children's behavior and emotion? Joint effects of perceived control and autonomy in the academic domain? *Journal of Personality and Social Psychology, 65*, 781–791.
- Quimby, J. L., & O'Brien, K. M. (2004). Predictors of student and career-decision making self-efficacy among non-traditional college women. *The Career Development Quarterly, 52*, 323–339.
- Ryan, R. M., & Connell, J. P. (1989). Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology, 57*, 749–761.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.

- Ryan, R. M., & Gronlick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology*, *50*, 55–558.
- Ryan, N. E., Hanin, D., & Solberg, V. (1994). Racial/ethnic, gender, and within group differences in college distress. In V. S. Solberg (Chair), *Recommendations for designing culturally relevant college persistence programming*. Symposium conducted at the 102nd Annual Convention of the American Psychological Association, Los Angeles.
- Ryan, R. M., & Powelson, C. (1991). Autonomy and relatedness as fundamental to motivation and education. *Journal of Experimental Education*, *60*, 49–66.
- Ryan, R. M., Stiller, J., & Lynch, J. H. (1994). Representations of relationships to teachers, parents, and friends as predictors of academic motivation and self-esteem. *Journal of Early Adolescence*, *14*, 226–249.
- Schumacker, R. E., & Lomax, R. G. (1996). *A beginners guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum Publishers.
- Shunk, D. (1981). Modeling and attributional effects on children's achievement: A self-efficacy analysis. *Journal of Educational Psychology*, *73*, 93–105.
- Solberg, V. S. (1999). ASIP report for South Division High School. [Unpublished Report].
- Solberg, V. S. H., Carlstrom, A. H., Howard, K. A. S., & Jones, J. E. (2007). Classifying at-risk high school youth: The influence of exposure to community violence and protective factors on academic and health outcomes. *Career Development Quarterly*, *55*, 313–327.
- Solberg, V. S., Close, W., & Metz, A. J. (2000). Promoting success pathways for middle and high school students: Introducing the adaptive success identity plan for school counselors: It's about making school successful for all students. In D. Atkinson & C. Juntenen (Eds.), *Counseling strategies*. Thousand Oaks, CA: Sage.
- Solberg, V. S., Gusavac, N., Hamann, T., Felch, J., Johnson, J., Lamborn, S., et al. (1998). The adaptive success identity plan (ASIP): A career intervention for college students. *The Career Development Quarterly*, *47*, 48–92.
- Stearns, E., & Glennie, E. J. (2006). When and why dropouts leave high school. *Youth and Society*, *38*, 29–57.
- Torres, J., & Solberg, V. (2001). Role of self-efficacy, stress, social integration and family support in Latino college student persistence and health. *Journal of Vocational Behavior*, *59*, 53–63.
- Trujillo, C. (1998). A comparative examination of classroom interactions between professors and minority and non-minority college students. *American Educational Research Journal*, *23*, 629–642.
- U.S. Census Bureau. (2005). Educational Attainment in the United States: 2004. Detailed Tables. Washington, DC: Author. Retrieved April 14, 2007 from <http://www.census.gov/population.socdemo/education/cps2004/tab08-1.pdf>.
- Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *Journal of Personality and Social Psychology*, *5*, 1161–1176.
- Walls, T. A., & Little, T. D. (2005). Relations among personal agency, motivation, and school adjustment in early adolescence. *Journal of Educational Psychology*, *97*, 27–31.
- Zimmerman, B., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal*, *29*, 663–676.
- Zimmerman, B., & Ringle, J. (1981). Effects of model persistence and statements of confidence on children's self-efficacy and problem solving. *Journal of Educational Psychology*, *73*, 485–493.