Emotion regulation and academic underperformance: The role of school burnout☆

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ABSTRACT

How students regulate emotions and the effects of emotion regulation (ER) on academic outcomes is gaining attention in educational psychology research. However, little is known about factors that explain their relationship and inform intervention. Two studies therefore examined the role of school burnout in explaining the relationship between ER strategies (reappraisal, suppression) and academic outcomes (GPA, absenteeism) among undergraduate students. Study 1 (N = 550) investigated ER strategies as antecedents to the effects of school burnout on academic outcomes. Significant indirect effects emerged to show that school burnout mediated the relationships between ER and GPA and absenteeism. Study 2 (N = 509) examined the temporal relationship between ER strategies, school burnout, GPA and absenteeism at two time points. Findings indicated that ER strategies preceded the effects of school burnout. School burnout, in turn, was identified as the mechanism linking (mediating) ER strategies to academic outcomes. Limitations, clinical applications, and future directions are outlined.

1. Introduction

It is evident that emotions play a critical role in motivation, self-regulated learning, and performance (Ahmed, van der Werf, Kuyper, & Minnaert, 2013; Burić & Sorić, 2012; Pekrun, Goetz, Titz, & Perry, 2002). Not surprisingly, emotion has been identified as an important factor for numerous academic-related outcomes (Linnenbrink-Garcia & Pekrun, 2011; Pekrun & Schutz, 2007). Research is now beginning to elucidate how the regulation of emotions can influence academic-related outcomes (Burić, Sorić, & Penezić, 2016). Emotion regulation (ER), defined as processes in which emotional reactions are monitored, evaluated, and modified (Thompson, 1994), appears to be integral to academic success across all age groups (Burić et al., 2016). Recent research is extending these findings to gain a better understanding of the specific ER strategies students engage in, and how these strategies impact academic-related outcomes (e.g., Ben-Eliyahu & Linnenbrink-Garcia, 2013; Burić et al., 2016). The present studies further examine the relationship between specific ER strategies and academic-related outcomes and attempt to identify potential mechanisms that might explain their relationship.

One construct that can shed light on how ER strategies impact academic outcomes is school burnout. Derived from the occupational burnout literature, school burnout is a deleterious consequence to mismanaged school-related stress and is characterized by cynicism toward the meaning of school, chronic exhaustion from school-related work, and a belief of inadequacy in school related accomplishment (Parker & Salmela-Aro, 2011; Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009; Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008). Like ER, school burnout is also related to academic outcomes including lower grade point average (GPA), school dropout, and absenteeism (Fimian & Cross, 1986; Korhonen, Linnanmaki, & Aunio, 2014; Lewis & Frydenberg, 2004; May, Bauer, & Fincham, 2015; Salmela-Aro et al., 2008, 2009; Yang, 2004). Importantly, Seibert, May, Fitzgerald, and Fincham (2016) have shown that the relationship between school burnout and poorer academic outcomes was contingent upon degree of self-control capacity. Although ER has been linked to occupational burnout (see Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010; Chang, 2013), the relation between ER and school burnout, with the exception just mentioned, remains unexplored.

The conceptual links among ER, school burnout, and academic outcomes can be understood in terms of the process model of emotion regulation (Gross, 1998). More specifically, the process model, derived from the response-tendency perspective (Gross, 1998), posits that emotional responses and/or outcomes are a product of an individual's

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emotional response-tendencies (ER strategies) which are considered adaptive reactions to a preceding stressor (e.g., uncomfortable situation). From this perspective, and because school burnout is a consequence of school-related stress, the degree to which students experience burnout may depend on the ER strategy they use to regulate that stress. For example, whether a student utilizes an adaptive or maladaptive ER strategy to regulate school-related stress, may further influence whether they experience school burnout, which in turn, is likely to impact academic outcomes. This suggests that school burnout might serve as a mechanism accounting for the effects of ER strategies on academic outcomes.

Of specific interest are the relationships between different ER strategies (e.g., reappraisal, suppression) and academic outcomes that students may implement to help ameliorate the adverse emotional consequences of school-related stress. For example, reappraisal, defined as changing the way a situation is conceptualized can help to decrease the emotional impact of that situation/stressor (Gross, 2002). For instance, rather than focusing on potential mistakes in giving a presentation, an individual may conceptualize it as a learning experience in order to reduce his or her anxiety. Suppression, in contrast, is comprised of holding back outward signs of inner feelings and is thought to be maladaptive as it fails to lessen the emotional experience (Gross, 2002); fighting back tears after receiving a poor grade is an example of suppressing inner feelings.

ER used effectively (e.g., engaging in reappraisal) has been shown to improve physiological reactivity to acute stress (Jamieson, Mendes, & Nock, 2013) and decrease symptom severity in Post-Traumatic Stress Disorder (Boden, Bonn-Miller, Kashdan, Alvarez, & Gross, 2012). Used ineffectively (e.g., engaging in suppression), ER has been associated with increased physical and depressive symptoms in response to occupational stress (Golkar et al., 2014; Jin-Kyoung, Jung-Im, & Do-Young, 2014). At a more general, trait-level context (as done in this current research) reappraisal is considered to be more adaptive while suppression is less adaptive (Ben-Eliyahu & Linnenbrink-Garcia, 2013). However, it is important to note that in certain contexts suppression can be beneficial (e.g., disliked classes, see Ben-Eliyahu & Linnenbrink-Garcia, 2013).

Accordingly, and informed by the process model of emotional regulation, the current study extends ER and school burnout literatures by examining their relationship to gain a clearer understanding of how school burnout might mediate the relationship between ER strategies and academic outcomes. Findings from the proposed study can inform clinicians and researchers alike regarding the role specific ER strategies play in ameliorating and/or worsening the deleterious effects of school burnout on academic outcomes.

2. Study 1

2.1. Introduction

To help advance our understanding of emotion regulation and its relationship to school burnout, we investigated the associations among emotion regulation strategies (reappraisal and suppression), school burnout, and academic outcomes (GPA and absenteeism). Given the tenets of the process model of emotion regulation, we hypothesized that emotion regulation will be indirectly associated with academic outcomes through school burnout. More specifically, because reappraisal tends to be more adaptive, it should be negatively related to school burnout, whereas suppression should be positively related to school burnout because it is less adaptive for managing stress. School burnout should subsequently be related to poorer school outcomes (i.e., decreased GPA and increased absenteeism). Due to the fact that the relationships between emotion regulation strategies, school burnout, and academic outcomes have been unexplored in the literature, we examined the possibility that school burnout might fully or partially mediate the association between ER and academic outcomes. Both the

School Burnout Inventory (SBI; Salmela-Aro et al., 2008, 2009) and the Maslach Burnout Inventory-Student Survey (MBI-SS; Schaufeli, Martínez, Pinto, Salanova, & Bakker, 2002) were used to evaluate the consistency of the role played by school burnout in the emotional regulation-academic outcome association.

2.2. Method

2.2.1. Participants

Five hundred and fifty undergraduate students (88.4% females, M_{age} = 19.63 years, SD = 1.83) from a major southeastern university in the United States participated in this study which was approved by the university's Institutional Review Board. The sample was comprised of 62.4% Caucasian, 13.1% Black, 16.7% Hispanic, and 3.3% endorsed other.

2.2.2. Measures

2.2.2.1. *Emotion regulation.* Emotion regulation was measured using the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003, suppression: α = 0.81, reappraisal: α = 0.86). The 10 item ERQ measures two emotion regulation strategies, expressive suppression (four items) and cognitive reappraisal (six items). Composite expressive suppression is represented by summing questions 2, 4, 6, and 9, which includes items such as "I keep my emotions to myself" and "I control my emotions by not expressing them." Composite cognitive reappraisal is represented by summing questions 1, 3, 5, 7, 8, and 10, which includes items such as "When I want to feel more positive emotion, I change the way I'm thinking about the situation" and "When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm."

2.2.2.2. *School burnout.* School burnout was assessed using the School Burnout Inventory (SBI; Salmela-Aro et al., 2008, 2009, α = 0.88) and the Maslach Burnout Inventory-Student Survey (MBI-SS; Schaufeli et al., 2002, α = 0.89). The SBI consists of 9 items measuring three first-order factors of school burnout: (a) exhaustion at school (four items), (b) cynicism toward the meaning of school (three items), and (c) sense of inadequacy at school (two items). Example items include "I feel overwhelmed by my schoolwork", "I'm continually wondering whether my schoolwork has any meaning" and "I often have feelings of inadequacy in my schoolwork" for exhaustion, cynicism, and inadequacy, respectively. SBI items are scored on a 6-point Likert agreement rating scale ranging from 1 (completely disagree) to 6 (completely agree). Higher scores on exhaustion, cynicism, and inadequacy represent greater school burnout. The MBI-SS consists of 15 items that constitute three scales: exhaustion (five items, α = 0.91), cynicism (four items, α = 0.93), and professional efficacy (six items, α = 0.89). Items include "I feel emotionally drained by my studies", "I have become less enthusiastic about my studies", and "I can effectively solve the problems that arise in my studies" for exhaustion, cynicism, and professional efficacy, respectively. MBI items are scored on a 7-point frequency rating scale ranging from 0 (never) to 6 (always). Higher scores on exhaustion and cynicism and low sores on efficacy are indicative of greater burnout. MBI efficacy scores were reversed coded for use in composite scores. For both the SBI and the MBI, summed scores form the first-order factors comprise a second-order overall school burnout score, with higher scores indicating greater school burnout.

2.2.2.3. *Academic performance.* Academic performance was measured using self-report of GPA. Major universities in the United States use a scale ranging from 0.0 to 4.0, which represents the total average of earned points accumulated by a student throughout their college career. A higher GPA is reflective of higher academic achievement.

2.2.2.4. *Absenteeism.* Absenteeism was measured using participants'

self-report on the number of classes they missed during the semester of this study.

2.2.3. Procedure

All students were recruited from classes in which professors offered opportunities to earn extra credit. One of the opportunities involved the present study. Prior to participation, participants signed informed consent and were then instructed to complete all surveys online.

2.2.4. Statistical analysis

Pearson correlations were used to evaluate associations among indicators of emotion regulation (ERQ), school burnout (SBI, MBI-SS), and academic performance (GPA, absenteeism). Using Mplus Version 7.3 (Muthén & Muthén, 1998–2012), measurement models were run first. Then, full latent mediation modeling was performed to test the indirect effects between predictors (emotion regulation strategies of suppression and reappraisal) and outcome variables (GPA, absenteeism) via school burnout scores (SBI, MBI-SS). Additionally, because mediational processes may be misleading when using cross-sectional data (Cole & Maxwell, 2003), we also tested the reverse latent model in which emotion regulation strategies mediated the relationship between school burnout and academic outcomes.

2.3. Results and discussion

Table 1 displays the means, standard deviations and Pearson correlations among variables. Regarding univariate associations, although suppression was significantly related to decreased GPA, reappraisal was not related to either indicator of academic performance. Indicators of school burnout demonstrated significant negative correlations with GPA and significant positive correlations with absenteeism. Suppression was significantly related to increased school burnout while reappraisal was significantly related to decreased school burnout.

Measurement models were run separately for the two burnout measures, reappraisal, and suppression. For burnout, two factor structures were examined, consistent with construct validation research in the burnout literature (Salmela-Aro et al., 2009; Schaufeli et al., 2002). The first factor structure was a correlated 3-factor model where items loaded onto the three intercorrelated burnout factors (e.g., exhaustion, cynicism, and inadequacy/reversed professional efficacy). The second factor structure was a second order factor analysis where items loaded onto their respective three factors, which then loaded onto a second order burnout factor. As can be seen in Table 2, different factor structures emerged as the best fitting model for the SBI and MBI-SS. For the SBI, although model fit was better for the 3-factor structure, inadequacy correlated near one with both exhaustion and cynicism resulting in a Psi matrix that was not positive definite. Because there was no error message for the second order factor structure, it was retained for further modeling. Modification indices were examined to determine whether model fit could be improved, and it could not. For the MBI-SS, the 3-factor model fit the data better than the second order factor structure. Modification indices were again examined and correlating two error terms significantly improved model fit (e.g., cynicism items three with four and exhaustion items one with two). These correlated errors are consistent with prior research (see Schaufeli et al., 2002). For suppression and reappraisal, their respective items served as indicators of the latent constructs. Model fit for suppression was excellent, and model fit for reappraisal was good after correlating two error terms (ERQ items 1 and 3).

The results of the latent mediation models used to test the indirect effects between predictors (emotion regulation strategies of suppression and reappraisal) and outcome variables (GPA, absenteeism) via school burnout scores (SBI, MBI-SS) are presented in Fig. 1 (panels A and B). Model fit indices demonstrated a reasonable fit for both SBI, $\chi^2(186) = 650.62$, $p < 0.001$; RMSEA = 0.07; CFI = 0.90; SRMR = 0.09, and MBI-SS, $\chi^2(302) = 749.73$, $p < 0.001$; RMSEA = 0.05; CFI = 0.95;

Table 1
Means, standard deviations and correlations among variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Absenteeism	–	−0.10*	0.02	0.03	0.06	0.06	−0.02	−0.05	0.10*	0.06	0.14*	0.16**	−0.03	−0.05
2. GPA	−0.17***	–	−0.13**	−0.01	−0.13**	−0.21***	−0.05	0.06	−0.13**	−0.08	−0.14**	−0.18***	−0.05	0.04
3. SBI T1	0.20***	−0.17***	–	0.62***	0.63***	0.39***	0.23***	−0.18**	0.62***	0.54***	0.49***	0.32***	0.21***	−0.04
4. MBI-SS: EX T1	0.16***	−0.09*	0.57***	–	0.54***	0.12*	0.11**	−0.14**	0.49***	0.62***	0.40***	0.16***	0.15***	−0.04
5. MBI-SS: CY T1	0.17***	−0.24***	0.56***	0.51***	–	0.43***	0.17***	−0.19***	0.44***	0.43***	0.58***	0.31***	0.16***	−0.11*
6. MBI-SS: rPE T1	0.14**	−0.20***	0.39***	0.16***	0.35***	–	0.16***	−0.32***	0.33***	0.22***	0.35***	0.51***	0.09*	−0.20***
7. Suppression T1	0.04	−0.20***	0.21***	0.14***	0.20***	0.15***	–	0.07	0.20***	0.19***	0.23***	0.18***	0.59***	0.01
8. Reappraisal T1	0.02	0.03	−0.10*	−0.06	−0.09*	−0.24***	0.07	–	−0.17***	−0.08	−0.20***	−0.30***	0.04	0.54***
9. SBI T2	–	–	–	–	–	–	–	–	–	0.67***	0.59***	0.29***	0.30***	−0.03
10. MBI-SS: EX T2	–	–	–	–	–	–	–	–	–	–	0.60***	0.13**	0.28***	0.05
11. MBI-SS: CY T2	–	–	–	–	–	–	–	–	–	–	–	0.35***	0.27***	−0.09*
12. MBI-SS: rPE T2	–	–	–	–	–	–	–	–	–	–	–	–	0.09*	−0.38***
13. Suppression T2	–	–	–	–	–	–	–	–	–	–	–	–	–	0.17***
14. Reappraisal T2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Study 1 M (SD)	0.93 (1.37)	3.32 (0.43)	26.79 (8.49)	20.81 (6.76)	10.02 (5.85)	13.71 (5.67)	14.75 (5.06)	30.38 (5.81)	30.61 (9.25)	13.13 (6.48)	6.81 (4.85)	13.86 (6.60)	14.93 (4.76)	29.00 (6.16)
Study 2 M (SD)	3.73 (3.27)	3.34 (0.40)	29.73 (8.89)	13.34 (6.21)	6.19 (4.78)	12.81 (6.29)	14.27 (4.66)	29.19 (6.34)	–	–	–	–	–	–

Note. Study 1 correlations are below the diagonal & N = 496–546 due to small amounts of missing data. Study 2 correlations are above the diagonal & N = 503–509 due to small amounts of missing data. T1 = Time 1. T2 = Time 2. SBI = School Burnout Inventory. MBI-SS = Maslach Burnout Inventory-Student Survey. EX = exhaustion. CY = cynicism. rPE = reversed professional efficacy.

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 2
Fit for the measurement models for Study 1 and Study 2.

Model[a]	χ^2	*df*	*p*	RMSEA	CFI	SRMR
Study 1						
SBI: 3-factor structure[b]	149.38	24	< 0.001	0.10	0.94	0.04
SBI: second order factor structure	305.30	32	< 0.001	0.13	0.88	0.15
MBI: 3-factor structure	323.72	85	< 0.001	0.07	0.96	0.04
MBI: second order factor structure	800.813	101	< 0.001	0.12	0.88	0.14
Suppression	6.02	2	0.049	0.06	1.00	0.01
Reappraisal	41.96	8	< 0.001	0.09	0.98	0.03
Study 2						
SBI Time 1	N/A					
SBI Time 2	N/A					
MBI Time 1: 3-factor structure	372.44	85	< 0.001	0.08	0.95	0.06
MBI Time 2: 3-factor structure	379.86	85	< 0.001	0.08	0.96	0.05
Suppression Time 1	7.08	2	0.029	0.07	0.99	0.02
Suppression Time 2	14.90	2	0.001	0.11	0.98	0.02
Reappraisal Time 1	24.79	8	0.002	0.06	0.99	0.02
Reappraisal Time 2	21.14	8	0.007	0.06	0.99	0.02

Note. SBI = School Burnout Inventory. MBI-SS = Maslach Burnout Inventory-Student Survey. N/A = There are no fit statistics for the SBI in Study 2 because there are only three indicators.

[a] Only final measurement models are reported (e.g., those models with correlated error terms). Additional measurement models are available upon request from the first author.

[b] The Psi matrix was not positive definite.

SRMR = 0.05. Note that for the SBI, the residual variance for in-adequacy had to be fixed to zero because it was negative, which is an issue that has been found in previous studies (Salmela-Aro et al., 2009). Standardized indirect effects were computed using bootstrapping with 5000 samples (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2004) and are presented in Table 3. Findings indicate significant indirect effects of suppression on GPA and absenteeism as well as of reappraisal on absenteeism via SBI. The indirect effect of reappraisal on GPA through SBI was not significant. Similarly, utilizing the MBI-SS, there were three significant ($p < 0.05$) indirect effects: (1)

suppression to GPA via cynicism, (2) reappraisal to GPA via cynicism, and (3) reappraisal to GPA via reversed professional efficacy. Three additional indirect effects were significant at a less stringent *p*-value ($p < 0.10$): (1) suppression to absenteeism, (2) suppression to GPA, and (3) reappraisal to absenteeism all via reversed professional efficacy.

Next we tested the reverse latent model. Evaluation of model fit indices demonstrate a reasonable fit for both SBI, $\chi^2(187) = 656.12$, $p < 0.001$; RMSEA = 0.07; CFI = 0.90; SRMR = 0.09, and MBI-SS, $\chi^2(303) = 757.44$, $p < 0.001$; RMSEA = 0.05; CFI = 0.95; SRMR = 0.05 (see Fig. 1, panels C and D). As shown in Table 3, only one indirect effect was significant. Burnout as measured by the SBI had an indirect effect on GPA through suppression. At a less stringent *p*-value (e.g., $p < 0.10$), the cynicism scale of the MBI-SS had an indirect effect on GPA through suppression.

Finally, we explored the possibility of full and partial mediation. The models in Fig. 1 were run again removing the direct paths from the predictor to the outcome. In all cases model fit was worse after taking out the direct paths, suggesting partial mediation. When burnout was the mediator, model fit indices were, $\chi^2(190) = 663.41$, $p < 0.001$; RMSEA = 0.07; CFI = 0.90; SRMR = 0.09; $\Delta\chi^2(4) = 12.79$, $p = 0.012$ for the SBI and $\chi^2(306) = 762.75$, $p < 0.001$; RMSEA = 0.05; CFI = 0.95; SRMR = 0.05; $\Delta\chi^2(4) = 13.020$, $p = 0.011$ for the MBI-SS. When the emotion regulation strategies were the mediators, model fit indices were, $\chi^2(189) = 679.14$, $p < 0.001$; RMSEA = 0.07; CFI = 0.90; SRMR = 0.09; $\Delta\chi^2(2) = 23.02$, $p < 0.001$ for the SBI and $\chi^2(309) = 808.05$, $p < 0.001$; RMSEA = 0.05; CFI = 0.94; SRMR = 0.06; $\Delta\chi^2(6) = 50.612$, $p < 0.001$ for the MBI-SS. However, these results should be viewed as tentative given the use of cross-sectional data and the exploratory nature of the results.

Overall findings provide evidence suggesting that emotion regulation strategies, two related measures of school burnout, and academic outcomes are significantly related. Although these results provide support for our initial hypothesis that the positive aspects of reappraisal and negative aspects of suppression would impact academic outcomes via school burnout, the reverse latent model fit the data similarly well. Additionally, the reverse model demonstrated significant indirect
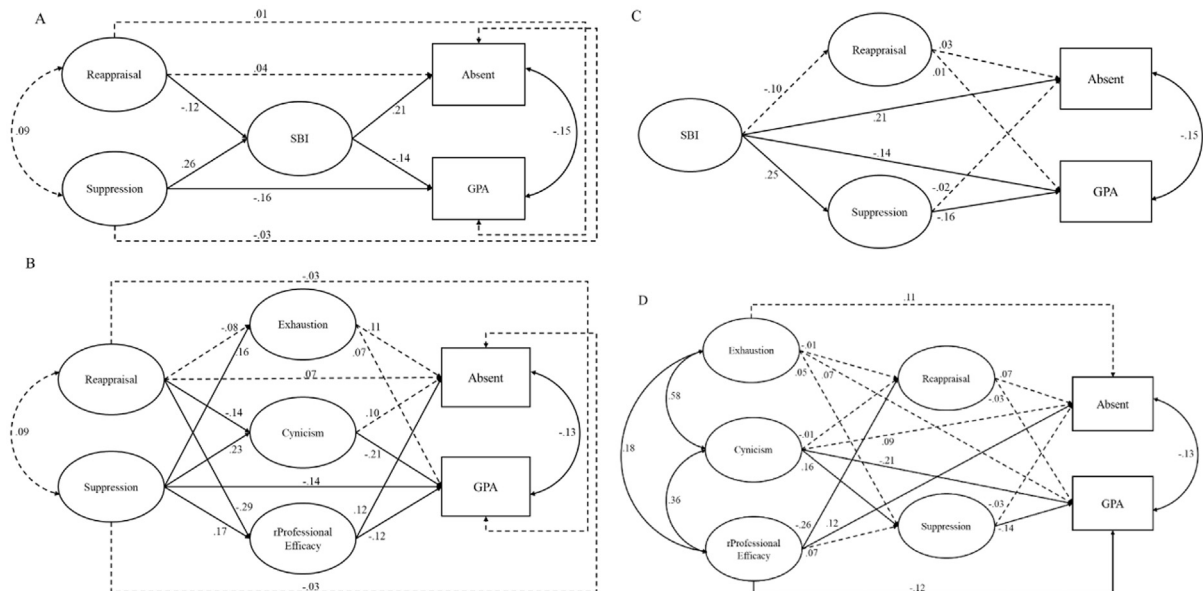

Fig. 1. Study 1 mediation models. Standardized regression estimates are shown. Solid lines are significant at $p < 0.05$ and dotted lines are non-significant. Panels (A, B) show school burnout scores (SBI: School Burnout Inventory, MBI-SS: exhaustion, cynicism and reversed professional efficacy) mediating the relationships between emotion regulation strategies (reappraisal, suppression) and academic performance (ABSENT = absenteeism, GPA). Panels (C, D) show the reverse latent models examining emotion regulation strategies mediating the relationship between school burnout and academic outcomes. Correlations among the burnout factors in Panel B are not shown for clarity. Model fit for Panel A was, $\chi^2(186) = 650.62$, $p < 0.001$, RMSEA = 0.07, CFI = 0.90, SRMR = 0.09, and Panel B was, $\chi^2(302) = 749.73$, $p < 0.001$, RMSEA = 0.05, CFI = 0.95, SRMR = 0.05. Model fit for Panel C was, $\chi^2(187) = 656.12$, $p < 0.001$, RMSEA = 0.07, CFI = 0.90, SRMR = 0.09, and Panel D was, $\chi^2(303) = 757.44$, $p < 0.001$, RMSEA = 0.05, CFI = 0.95, SRMR = 0.05.

Table 3
Standardized indirect effects for Study 1.

Indirect effect	Estimate	p	95% CI [LB, UB]
Burnout as mediator			
Suppression → SBI → absenteeism	0.056	0.001	[0.022, 0.090]
Suppression → SBI → GPA	− 0.037	0.026	[− 0.069, − 0.004]
reappraisal → SBI → absenteeism	− 0.026	0.045	[− 0.052, − 0.001]
Reappraisal → SBI → GPA	0.017	0.120	[− 0.005, 0.039]
Suppression → MBI: EX → absenteeism	0.018	0.120	[− 0.005, 0.040]
Suppression → MBI: CY → absenteeism	0.022	0.215	[− 0.013, 0.056]
Suppression → MBI: rPE → absenteeism	0.020	0.094	[− 0.003, 0.044]
Suppression → MBI: EX → GPA	0.011	0.281	[− 0.009, 0.032]
Suppression → MBI: CY → GPA	− 0.049	0.010	[− 0.086, − 0.012]
Suppression → MBI: rPE → GPA	− 0.020	0.074	[− 0.042, 0.002]
Reappraisal → MBI: EX → absenteeism	− 0.009	0.255	[− 0.024, 0.006]
Reappraisal → MBI: CY → absenteeism	− 0.013	0.245	[− 0.035, 0.009]
Reappraisal → MBI: rPE → absenteeism	− 0.035	0.056	[− 0.071, 0.001]
Reappraisal → MBI: EX → GPA	− 0.006	0.375	[− 0.018, 0.007]
Reappraisal → MBI: CY → GPA	0.029	0.039	[0.001, 0.057]
Reappraisal → MBI: rPE → GPA	0.035	0.043	[0.001, 0.069]
ERQ as mediator			
SBI → suppression → absenteeism	− 0.006	0.618	[− 0.030, 0.018]
SBI → suppression → GPA	− 0.040	0.006	[− 0.069, − 0.012]
SBI → reappraisal → absenteeism	− 0.003	0.558	[− 0.014, 0.008]
SBI → reappraisal → GPA	− 0.001	0.848	[− 0.011, 0.009]
MBI: EX → suppression → absenteeism	− 0.001	0.730	[− 0.009, 0.006]
MBI: CY → suppression → absenteeism	− 0.005	0.556	[− 0.020, 0.011]
MBI: rPE → suppression → absenteeism	− 0.002	0.636	[− 0.010, 0.006]
MBI: EX → suppression → GPA	− 0.007	0.479	[− 0.026, 0.012]
MBI: CY → suppression → GPA	0.023	0.069	[− 0.048, 0.002]
MBI: rPE → suppression → GPA	− 0.010	0.231	[− 0.026, 0.006]
MBI: EX → reappraisal → absenteeism	− 0.001	0.879	[− 0.011, 0.009]
MBI: CY → reappraisal → absenteeism	− 0.001	0.864	[− 0.012, 0.010]
MBI: rPE → reappraisal → absenteeism	− 0.017	0.178	[− 0.043, 0.008]
MBI: EX → reappraisal → GPA	0.000	0.919	[− 0.007, 0.007]
MBI: CY → reappraisal → GPA	0.000	0.908	[− 0.007, 0.008]
MBI: rPE → reappraisal → GPA	0.008	0.525	[− 0.017, 0.034]

Note. SBI = School Burnout Inventory. MBI-SS = Maslach Burnout Inventory-Student Survey. EX = exhaustion. CY = cynicism. rPE = reversed professional efficacy. CI = confidence interval. LB = 95% CI lower bound. UB = 95% CI upper bound.

effects between indices of school burnout and academic outcomes through emotion regulation strategies, albeit with fewer significant effects than the hypothesized models. Therefore, in order to provide a better understanding of whether burnout or emotion regulation strategies are the ultimate antecedent, Study 2 introduced a temporal element to allow stronger inferences regarding the direction of effects.

3. Study 2

3.1. Introduction

Study 2 expanded on the findings of Study 1 by examining how emotion regulation strategies, school burnout, and academic outcomes are associated over time. Specifically, using a separate sample from Study 1, temporal relations between indices of emotion regulation strategies (suppression, reappraisal), school burnout (SBI, MBI) and academic performance (GPA, absenteeism) were examined.

3.2. Method

3.2.1. Participants and procedure

All participants were recruited from university classes at a major southeastern university in the United States where the current study was offered as one form of extra credit. Prior to participation, all students provided written consent for the study as approved by the institutional review board. Participants completed measures of school burnout and emotion regulation online at two separate times spaced six weeks apart (week 3 and 9 of the academic semester). Academic outcomes were collected at the second time-point. Of the 543 participants who completed the Time 1 survey, 509 responded at Time 2 representing 6% attrition. Participants were mostly female (89.6% female; M_{age} = 19.87 years, SD = 2.12), and the sample was comprised of 70.3% Caucasian, 14.1% Latino/Hispanic, 11.2% African American/Black, 2.9% Asian/Pacific Islander, 0.6% Other, 0.4% Middle Eastern, and 0.4% 'Prefer not to say'.

3.2.2. Measures

All measures used in study 1 were used in study 2: school burnout (SBI; Salmela-Aro et al., 2009, α = 0.90 & 0.93 at Time 1 and 2 respectively; MBI-SS; Schaufeli et al., 2002, α = 0.77, 0.92, 0.92, & 0.89 for overall MBI-SS, exhaustion, cynicism, and professional efficacy, respectively, at Time 1 and α = 0.81, 0.94, 0.94, & 0.91 for overall MBI-SS, exhaustion, cynicism, and professional efficacy, respectively, at Time 2), emotion regulation (ERQ; Gross & John, 2003, suppression: α = 0.77 & 0.81, reappraisal: α = 0.89 & 0.90 at Time 1 and 2, respectively), and academic outcomes (GPA, absenteeism).

3.2.3. Statistical analysis

Pearson correlations evaluated associations among indicators of emotion regulation strategies (suppression, reappraisal), school burnout (SBI, MBI-SS), and academic performance (GPA, absenteeism). Using SEM with Mplus 7.3, measurement models and tests for measurement invariance across time were conducted before hypothesis testing. Next, a 5-step, latent cross-lagged panel analysis was conducted in order to parse out the temporal ordering of emotion regulation strategies and school burnout. The five steps were: (1) the Autoregressive Model included autoregressive paths and correlations among variables within a time point, (2) the Causal Model included Model 1 plus the hypothesized causal paths from reappraisal and suppression to burnout, (3) the Reverse Causal Model included Model 1 plus the reversed causal paths (e.g., burnout to suppression and reappraisal), (4) the Reciprocal Model included Models 1, 2, and 3, and (5) Full Cross-Lag Model added the remaining paths to Model 4 to make it a full cross-lag panel analysis. The path from a variable at Time 1 to itself at Time 2 (e.g., burnout at Time 1 predicting burnout at Time 2) is an autoregressive path, and paths between different variables are cross-lagged paths. The cross-lagged paths from burnout to emotion regulation and vice versa were used as evidence for temporal order. Following the cross-lagged analyses, mediation was tested in two ways. First, GPA and absenteeism were added to the final cross-lagged panel model (Model 5 – the Full Cross-Lag Model). Second, based on the results of the cross-lagged analyses, a mediated model with ER strategies at Time 1, burnout and academic outcomes at Time 2 was run and indirect effects were examined. Separate models were run for the SBI and MBI-SS with 5000 bootstrap samples (MacKinnon et al., 2004; Preacher & Hayes, 2004).

3.3. Results and discussion

Means, standard deviations, and Pearson correlations among variables are presented in Table 1. Suppression and reappraisal at both time points were uncorrelated with academic outcomes. School burnout (SBI, MBI-SS) at Time 1 and at Time 2 demonstrated significant negative correlations with GPA. School burnout (SBI, MBI-SS) at Time 2, but

Table 5
Standardized results of the Full Cross-Lag Model.

Predictors at Time 1 (SBI)	SBI	Suppression	Reappraisal	Absenteeism	GPA
SBI	0.59*** (0.04)	0.04 (0.05)	0.09 (0.05)	0.06 (0.05)	− 0.17*** (0.05)
Suppression	0.10* (0.05)	0.69*** (0.04)	− 0.04 (0.05)	− 0.03 (0.05)	− 0.01 (0.05)
Reappraisal	− 0.08 (0.05)	− 0.01 (0.05)	0.59*** (0.04)	− 0.03 (0.05)	0.03 (0.05)

Predictors at Time 1 (MBI-SS)	Outcomes[a] at Time 2 β (SE)						
	Exhaustion	Cynicism	Reversed professional efficacy	Suppression	Reappraisal	Absenteeism	GPA
Exhaustion	0.62*** (0.05)	0.17** (0.06)	0.03 (0.06)	0.08 (0.06)	0.05 (0.07)	− 0.01 (0.06)	0.07 (0.06)
Cynicism	0.01 (0.07)	0.39*** (0.07)	0.08 (0.07)	0.02 (0.07)	− 0.00 (0.07)	0.05 (0.07)	− 0.11 (0.07)
Reversed professional efficacy	0.16** (0.06)	0.13* (0.06)	0.40*** (0.06)	− 0.04 (0.07)	− 0.03 (0.06)	0.05 (0.06)	− 0.18** (0.06)
Suppression	0.11** (0.04)	0.14** (0.04)	0.12* (0.05)	0.69*** (0.04)	− 0.01 (0.05)	− 0.03 (0.05)	− 0.00 (0.05)
Reappraisal	0.04 (0.05)	− 0.08 (0.05)	− 0.20*** (0.05)	− 0.01 (0.06)	0.57*** (0.05)	− 0.02 (0.06)	0.00 (0.05)

Note. SBI = School Burnout Inventory. MBI-SS = Maslach Burnout Inventory-Student Survey.

[a] Results for the paths from predictors at Time 1 to burnout and the ERQ at Time 2 are the same with and without the academic outcomes.

* *p* < 0.05.
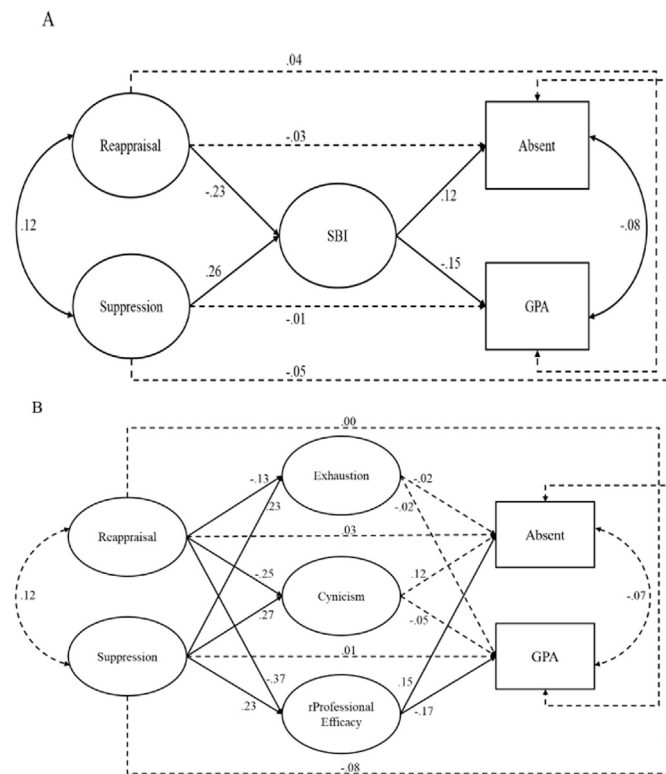** *p* < 0.01.
*** *p* < 0.001.

Fig. 2. Study 2 mediation models. Standardized regression estimates are shown. Solid lines are significant at *p* < 0.05 and dotted lines are non-significant. Panel A shows the SBI (School Burnout Inventory), and Panel B shows the MBI-SS (exhaustion, cynicism and reversed professional efficacy) mediating the relationships between emotion regulation strategies (reappraisal, suppression) and academic performance (ABSENT = absenteeism, GPA). Correlations among the burnout factors of the MBI-SS are not shown for clarity. Model fit for the SBI was: $\chi^2(80) = 184.05$, *p* < 0.001, RMSEA = 0.05, CFI = 0.97, SRMR = 0.06. Model fit for the MBI-SS was: $\chi^2(302) = 771.00$, *p* < 0.001, RMSEA = 0.06, CFI = 0.95, SRMR = 0.05.

Table 6
Standardized indirect effects for Study 2.

Indirect effect	Estimate	*p*	95% CI [LB, UB]
Suppression → SBI → absenteeism	0.031	0.100	[− 0.006, 0.067]
Suppression → SBI → GPA	− 0.039	0.022	[− 0.072, − 0.006]
Reappraisal → SBI → absenteeism	− 0.027	0.009	[− 0.047, − 0.007]
Reappraisal → SBI → GPA	0.035	0.001	[0.014, 0.055]
Suppression → MBI: EX → absenteeism	− 0.004	0.758	[− 0.032, 0.024]
Suppression → MBI: CY → absenteeism	0.032	0.145	[− 0.011, 0.075]
Suppression → MBI: rPE → absenteeism	0.035	0.017	[0.006, 0.063]
Suppression → MBI: EX → GPA	− 0.005	0.736	[− 0.036, 0.026]
Suppression → MBI: CY → GPA	− 0.014	0.448	[− 0.052, 0.023]
Suppression → MBI: rPE → GPA	− 0.038	0.011	[− 0.067, − 0.009]
Reappraisal → MBI: EX → absenteeism	0.003	0.770	[− 0.015, 0.020]
Reappraisal → MBI: CY → absenteeism	− 0.029	0.146	[− 0.067, 0.010]
Reappraisal → MBI: rPE → absenteeism	− 0.056	0.006	[− 0.096, − 0.016]
Reappraisal → MBI: EX → GPA	0.003	0.750	[− 0.016, 0.022]
Reappraisal → MBI: CY → GPA	0.013	0.452	[− 0.021, 0.047]
Reappraisal → MBI: rPE → GPA	0.061	0.005	[0.018, 0.104]

Note. SBI = School Burnout Inventory. MBI-SS = Maslach Burnout Inventory-Student Survey. EX = exhaustion. CY = cynicism. rPE = reversed professional efficacy. CI = confidence interval. LB = 95% CI lower bound. UB = 95% CI upper bound.

academic outcomes (GPA, absenteeism) and hypothesized that the effects of ER strategies on academic outcomes would be mediated by school burnout. Consistent with our hypothesis, Study 1 suggested that ER strategies work through school burnout to impact academic outcomes. However, the data were also consistent with an alternative model in which ER strategies mediated the impact of school burnout on academic outcomes. In an attempt to establish direction of effects, Study 2 investigated the links between ER strategies, school burnout, and academic outcomes at two time points. Results showed that Time 1 reappraisal negatively, and suppression positively, predicted school burnout at Time 2. School burnout at Time 2 was further related to lower GPA and increased absenteeism, and served as a mechanism for the effects of ER strategies on academic outcomes. However, Time 1 burnout was only related to GPA and not absenteeism, suggesting that the relationship between burnout at Time 2 and absenteeism may be a spurious finding. It is also possible that the time lag between burnout at Time 1 and absenteeism was too long to capture the impact of burnout on absenteeism. It is possible that students who are feeling the effects of burnout will simultaneously miss classes. Therefore, we encourage future research to examine this timing issue.

Findings generally support the process model of emotion regulation,

shown that school burnout is an important phenomenon with deleterious effects on academic outcomes (Korhonen et al., 2014). However, despite their parallel connections with academic outcomes, no study has examined the relationship between ER and school burnout.

To fill this gap, we conducted two studies assessing the relationships between ER strategies (reappraisal, suppression), school burnout, and

showing that ER strategies precede the effects of school burnout on academic outcomes. Specifically, how students regulated the effects of school-related stress during the third week of the semester, predicted levels of school burnout six weeks later, which was in turn related to GPA and absenteeism. Consistent with previous findings showing reappraisal to be adaptive (Jamieson et al., 2013) and suppression to be maladaptive (Golkar et al., 2014) in regard to the emotional consequences of a stressor, students who reported engaging in reappraisal at Time 1 experienced lower levels of school burnout at Time 2. Conversely, students who reported suppressing their emotions at Time 1 demonstrated higher levels of school burnout at Time 2. The combined results suggest that students who suppress the effects of school-related stress are more likely to experience higher levels of school burnout as compared to students who reappraise school-related stress. Overall it appears that school burnout may be an important indicator of whether or not students are effective or ineffective in regulating school-related stress. School burnout, in turn, appears to be a mechanism that relates ER strategies to academic outcomes.

4.1. Limitations

One important limitation of these studies is that the samples were predominantly female (88.4% for Study 1, 89.6% for Study 2) thereby limiting the discovery of potential gender differences. Previous research has shown gender effects in regards to ER (Brody, 2000; Gross & John, 2003), therefore warranting further investigation into the potential influence of gender differences on specific ER strategies. However, even though males and females may handle the emotional impact of school-related stress differently, prior research indicates that school burnout is associated with physiology linked to cardiovascular risk for both male and female undergraduates (May, Sanchez-Gonzalez, Brown, Koutnik, & Fincham, 2014; May, Sanchez-Gonzalez, & Fincham, 2014).

Two additional limitations are important to note. First, dispositional measures of only two ER strategies were examined, limiting our ability to determine whether students employed other strategies to regulate their emotions surrounding school-related stress that may have impacted our findings. Prospective research assessing several ER strategies can help determine which strategies students are using and whether some are more effective than others. Second, our measures of absenteeism and GPA are susceptible to social desirability bias as students were recruited from college classrooms. Attendance and grade records are likely to be more reliable and should be utilized in future research. However, previous findings demonstrate that self-reported college GPA and actual college GPA are highly correlated ($r = 0.90$, Kuncel, Credé, & Thomas, 2005). Lastly, only two time points were used in Study 2 to examine the temporal sequence between ER strategies, burnout, and academic outcomes.

4.2. Implications for practice and directions for future research

Establishing emotion regulation strategies, namely reappraisal and suppression, as a precursor to school burnout has implications for school psychologists, counselors, and educators alike. Specifically, the results suggest that interventions aimed at increasing students' use of reappraisal and decreasing their use of suppression will be particularly beneficial. School psychologists and counselors could incorporate information about these ER strategies into their one-on-one or classroom sessions with students who appear to be suffering from school-related stress. Incorporating this information is consistent with cognitive-behavioral therapy, which has been shown to increase the use of reappraisal (e.g., Aldao, Jazaieri, Goldin, & Gross, 2014; Moscovitch et al., 2012). Thus, many practicing psychologists and counselors may already be teaching reappraisal in practice, and the present findings support greater incorporation of this emotion regulation technique in educational settings.

Additionally, university instructors, particularly those who teach topics related to emotions or freshman level orientation courses, could incorporate instructional material on suppression and reappraisal into their classrooms. Pedagogically active engagement with course content fosters deeper learning (e.g., Bell & Kozlowski, 2008; Brown & Sitzmann, 2011; Keith, Richter, & Naumann, 2010). Therefore, instructors are encouraged to incorporate assignments or in-class activities that require active engagement (e.g., practice and feedback), ensuring that students are able to identify when they are engaging in suppression and how to redirect their efforts to use reappraisal of the situation instead.

As tertiary education appears to be more common for emerging adults (Snyder & Dillow, 2013), our findings point to the potential importance of including school burnout in research on ER and academic outcomes among undergraduates. Although our findings constitute a novel contribution to research pertaining to emotion regulation, school burnout, and academic performance, there is a need to account for individual differences in ER strategies to understand why some students are more successful at implementing healthier ER strategies. Understanding protective factors can help further inform intervention as it pertains to working with ER strategies to ameliorate the deleterious effects of school burnout. One potentially fruitful avenue for future research may be found in the intersection of ER, mindfulness, and perceived control. For example, Pagnini, Bercovitz, and Langer (2016) developed a framework for clinicians to use mindfulness without meditation to increase regulation and the perception of control to improve well-being in clients. Future research could adapt this framework to apply to university settings.

Furthermore, research should also investigate emotion regulation strategies in addition to suppression and reappraisal that may be specific to the context of academic stress. For instance, integrative emotion regulation, or the ability to accept negative emotions, relates to less arousal and greater cognitive recall in Israeli college students (Roth et al., 2014). Further, according to the process model of emotion regulation, there are several points in the emotion-generative process where different regulatory strategies may be utilized (Gross, 1998, 2015). Specifically, individuals may choose different situations (situation selection), attempt to modify the situation they are in (situation modification), choose to redirect their attention in a situation (attentional deployment), reappraise the situation (cognitive change; most commonly reappraisal as examined here), change their response to a situation (response modulation; e.g., suppression) or an amalgamation of these strategies in order to change the emotional impact (Gross, 2015). In a review of the emotion regulation literature, Gross (2015) noted that despite the significance of situation modification there has been relatively little research on its impact. Therefore, future research on situation modification and integrative emotion regulation may help further our understanding of how students manage school burnout. Utilizing the recently developed academic emotion regulation questionnaire (AERQ; Burić et al., 2016) may facilitate this quest as it assesses specific ER strategies in various academic contexts.

Finally, although our use of two independent measures of school burnout helps to demonstrate the reliability of the study findings, some differences across the measures emerged. For example, in Study 1 the indirect effect of reappraisal on GPA was significant for the cynicism and reversed professional efficacy factors of the MBI-SS but not the SBI. Additionally, different factor structures emerged as the best fitting model for the SBI and MBI-SS, and measurement issues involving inadequacy emerged for the SBI but not the MBI-SS. Additionally, a review of the measures suggests they may be tapping slightly different constructs (e.g., the SBI has an inadequacy subscale whereas the MBI has a professional efficacy scale). Measurement development was outside the scope of the current study; yet, future research may find utility in building a single comprehensive and concise measure of school burnout.

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