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PROACTIVE COPING, ENGAGEMENT IN LEARNING AND DEEP PROCESSING AS MEDIATORS BETWEEN AUTONOMOUS MOTIVATION AND ADJUSTMENT AT SCHOOL

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ABSTRACT. The study explores the role of autonomous motivation in predicting proactive coping, motivational study strategies and tested strategies as mediators of the relationship between coping strategy and adjustment at school. A sample of 183 high school students completed a series of questionnaires assessing motivation, coping, study strategies, and perceptions of adjustment at school. Findings revealed one model for consequences of autonomous motivation. Analyses that used structural equation modeling showed that the students' self-determined motivation predicted proactive coping strategy autonomous goal setting with self-regulatory goal attainment cognitions and behaviour. Further, these resilience resources predicted deep processing, students' intentions to persist in school task, effort, and implicit academic adjustment like education aspiration, homework and students' intentions to persist in high school. The findings underscore the importance of autonomous motivation and proactive coping strategy in adjustment at school and suggest that interventions could usefully target the consequences of these processes. The theoretical and practical implications as well as the controversy over the relation between motivation, coping and school adjustment are discussed.

Keywords: *self-determination theory, autonomous motivation, proactive coping, engagement in learning, deep processing, adjustment at school*

ZUSAMMENFASSUNG. Proaktives Coping, Engagement In Lernen Und Tiefverarbeitung Als Mediatoren Zwischen Autonomen Motivation Und Schulanpassung. Die Studie untersucht die Rolle der autonomen Motivation bei der Vorhersage proaktives Coping, Lernmotivation Strategien, und getesteten Strategien als Vermittler der Beziehung zwischen Bewältigungsstrategie und Anpassung an der Schule. Eine Probe von 183 Gymnasiasten füllte eine Reihe von

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Fragebögen aus, die Motivation, Coping, Studienstrategien und Wahrnehmungen der Anpassung an der Schule beurteilen. Die Ergebnisse zeigten ein Modell für die Konsequenzen der autonomen Motivation. Analysen, die strukturelle Gleichungsmodellierung verwendeten, zeigten, dass die selbstbestimmte Motivation proaktive Bewältigungsstrategie autonome Zielsetzung mit Selbstregulierung Ziel Erreichung Kognitionen und Verhalten vorhersagt. Darüber hinaus prognostizierten diese Resilienzressourcen eine tiefe Verarbeitung, die Absichten der Studierenden, in der Schulaufgabe, Anstrengung und implizite akademische Anpassung wie Bildungsaspiration, Hausaufgaben und die Absichten der Studenten, im Gymnasium zu bestehen. Die Ergebnisse unterstreichen die Bedeutung der autonomen Motivation und proaktiver Bewältigungsstrategie in der Anpassung an der Schule und suggerieren, dass Interventionen die Konsequenzen dieser Prozesse sinnvoll ansprechen könnten. Die theoretischen und praktischen Konsequenzen sowie die Kontroverse über die Beziehung zwischen Motivation, Coping und Schulanpassung werden diskutiert.

Schlüsselwörter: *Selbstbestimmungstheorie, autonome Motivation, proaktives Coping, Engagement im Lernen, tiefe Verarbeitung, Schulanpassung*

Considerable research reveals that motivation can lead to important outcomes, such as proactive coping, engagement in learning and adjusting at school. Although most studies have focused on the effects of intrinsic motivation (Deci & Ryan, 1985, 1987), more recent research based on the tenets of self-determination theory (SDT; Deci & Ryan, 2000, Ryan & Deci, 2002; 2008; Soenens & Vansteenkiste, 2010) has dealt with the whole spectrum of motivations. The various forms of motivation are posited to differ in their inherent levels of self-determination. SDT (Deci & Ryan, 2000) theorizes that behaviors vary with respect to how autonomous, or self-motivated, they are (Ryan & Deci, 2008) and focuses on the presence of autonomy embedded in motives such as those outlined by the functional approach (Vansteenkiste, Simons, Lens, Soenens & Matos, 2005; Zhou, Ma & Deci, 2009). From SDT research a*utonomous motivation* concerns actions that are experienced as emanating from or congruent with one's self, or in attributional terms, have an internal perceived locus of causality of an action (Ryan & Connell, 1989). Autonomous behaviors reflect one's values or interests, and one feels like an "origin" rather than a "pawn" in enacting them (deCharms, 1968).

Because self-determination has been hypothesized to be associated with enhanced psychological functioning, we expect self-determined forms of motivation to lead to positive outcomes, such as proactive coping, effort and persistence, in

domains such as work, sport and school (Ryan & Deci, 2000; Vansteenkiste, Niemiec & Soenens, 2010). SDT's may be particularly relevant to adjustment at school (i.e., satisfaction with one's academic life, intentions of continuing one's schooling, educational aspirations, etc.), which can stem either from personal values and initiatives or from external pressures, and thus might be expected to vary in their autonomous motives.

Autonomous motivation

According to SDT, motivation is not just based on quantity (i.e., how much motivation a person experiences), but also on the quality of one's motivation to perform tasks (Sheldon, 2004; Sheldon Arndt & Houser-Marko, 2003). According to Sheldon et al. (2003) and Benedetti, Diefendorff, Gabriel & Chandler (2015), the quality of one's motivation ranges from autonomous to controlled with the former being higher in quality. Autonomous motivation occurs when individuals identify with goal pursuits that are integrated for identified or intrinsic reasons (Sheldon et al., 2003). Identified reasons for goal pursuit involve pursing goals that are set extrinsically (e.g., by the academic setting), but are aligned with one's goals or values. This is an autonomous form of extrinsic motivation, as individuals engage in a behavior because they personally find it important, and he/she can regulate the behavior more willingly or volitionally (e.g., planning to attend school because of its personal relevance). Intrinsic motivation involves goals that are pursued because they are inherently enjoyable and self-set (Deci & Ryan, 2000; Gagné & Deci, 2005). In remaining consistent with SDT and prior work, we operationalized autonomous motivation as a combination of *identified* and *intrinsic* motivations (Bono & Judge, 2003; Judge, Bono, Erez & Locke, 2005; da Motta Veiga & Gabriel, 2016; Sheldon & Elliot, 1998; Sheldon et al., 2003). Both intrinsically motivated and well-internalized activities are regulated by autonomous motivation (Soenens & Vansteenkiste, 2010).

The degree to which student motivation is self-determined predicted different educational adjustment. Self-determined reasons for engaging in a particular behavior are associated with successful adaptation and educational outcomes (Reeve, 2009). In contrast, less self-determined forms of motivation (represented by external regulation, introjected regulation) have been associated with dropout from school (Sénécal, Koestner & Vallerand, 1995). Thus, self-determined forms of motivation lead to the use of adaptive of coping strategies and have been proposed to promote a more active engagement (effort, task persistence) (Skinner & Edge, 2002). Studies have shown that people high in

the relatively stable autonomy orientation tend to be autonomously motivated and high in proactive coping (Williams, Grow, Freedman, Ryan & Deci, 1996). Autonomous motivation and implicit proactive coping has been consistently associated with more positive outcomes, including greater long-term persistence (e.g., Pelletier, Fortier, Vallerand & Briere, 2001) and more self-regulated learning (e.g., Vansteenkiste, Zhou, Lens & Soenens, 2005).

In the present study, we examined the association between autonomous, proactive coping, engagement in learning (effort, persistence) and adjustment at school (i.e., satisfaction with one's academic life, belonged at the school, satisfaction with the school intentions of continuing one's schooling and educational aspirations). We expected that autonomous motivation would contribute positively to proactive coping, engagement and adjustment at school. In addition, we explored whether proactive coping and engagement in learning could account for the hypothesized relation between autonomous motivation and academic adjustment.

Proactive coping

Proactive coping (e.g., planning, information-seeking positive reinterpretation, self-encouragement) consists of efforts undertaken in advance of a potentially stressful event to prevent it or to modify its form before it occurs. It involves the accumulation of resources and the acquisition of skills that are not designed to address any particular stressor but to prepare in general, given the recognition that stressors do occur and that to be forearmed is to be well prepared (Greenglass & Fiksenbaum, 2009). Thus, proactive people tend to be resilient to the challenges they face and they find resources to help them overcome an uncomfortable situation (Chiaburu, Baker & Pitariu, 2006). By using these interactive tools, people with high levels of proactive coping may reserve considerable resources to deal with stressors, which leads to improved emotional stability when facing stressful events (Liu et al., 2007). They see risks, demands, and opportunities in the future, but they do not appraise them as a threat, harm, or loss. Rather, they perceive demanding situations as personal challenges Schwarzer & Taubert, 2002). Individuals are not reactive, but proactive in the sense that they initiate a constructive path of action and create opportunities for growth and builds up resources that assure quality of functioning, such engagement in activity and self-regulation strategy.

The link between proactive coping responses and behavior engagement is deeply rooted in the self-regulation theory proposed by Carver and Scheier (1998). Specifically, these proactive coping strategies (such as problem solving, information seeking, and self-encouragement) aim to actively manage the academic

stress, so students who adopt both of these coping responses keep on be committed to and strive for their goals and are more likely to report higher rates of behavioral engagement in learning (Struthers, Perry & Menec, 2000).

Engagement in learning

The concept of behavioral engagement allows also exploration of what students are doing in classrooms, and whether the strategy they use contributes to their learning (Dunleavy & Milton, 2009). Students who are engaged show sustained behavioral involvement in learning activities accompanied by a positive emotional tone. They select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and perseverance in the implementation of learning tasks; they show generally deep strategy during ongoing learning activities (Claxton, 2007).

Within the engagement domain, in this study we focused on two constructs – *effort* and *persistence*. Review of previous research reveals that persistence / effort is a proper indicator of achievement outcome (Elliot, McGregor & Gable, 1999; Xiang & Lee, 2002). Effort is the amount of energy expended in a learning process. Persistence refers to the continuous effort in learning especially when the student is faced with some barriers or obstacles (Pintrich, Smith, Garcia & McKeachie, 1993; Zimmerman & Risemberg, 1997). Persistence / efforts not only reflect motivation but serve as important indices for achievement behavior and implicit for academic adjustment (Goa & Newton, 2009).

A number of researchers have, in the context of achievement goals explored the contribution of persistence and effort in students' academic adjutement. Research evidence shows that effort and persistence make a positive contribution to the prediction of academic outcome (Miller, Greene, Montalvo, Ravindran & Nichols, 1996; Wentzel, 1996). In this analysis, both effort and persistence are found to relate positively to academic adjustment (Simons, Dewitte & Lens, 2004). Data drawn from other studies have shown the interrelations between efforts and persistence and other motivational variables; for example, study processing strategies (Fenollar et al., 2007), competence beliefs and utility (Chouinard, Karsenti & Roy, 2007). For example, Chouinard et al. (2007) found that competence beliefs act as a determinant of effort, whereas Simons et al. (2004) reported that task orientation contributes to the prediction of persistence. In contrast, we predict that effort and persistence makes a direct contribution to the prediction of deep processing strategies.

The reasons underlying students' adjustment to the academic adjustment are likely to be antecedents of the kind of strategies they use to face the

academic task. The self-determination framework has been considered relevant in the academic setting to explain academic involvement and outcomes (Deci & Ryan, 2000; Vallerand, 1997).

Deep processing

Researchers in education have found a significant relationship between engagement in learning and strategy use (Goa & Newton, 2009; McWhaw & Abrami, 2002; Mih & Mih, 2013). In this view, student engagement is viewed as motivated behavior that can be indexed by the kinds of cognitive strategies students choose to use (e.g., simple or "surface" processing strategies such as rehearsal versus "deeper" processing strategies such as elaboration) and by their willingness to persist with difficult tasks (Mih, 2013; Skinner & Belmont (1993). The consequence of engagement in learning is the fact that students will use of deep, rather than superficial and shallow, learning strategies to create complex knowledge structures (Mih & Mih, 2016), and we expect this

Taking into account the above mentioned findings, the purpose of the present study was to investigate the extent to which autonomous motivation predicts subsequent proactive coping, and how proactive coping influences adjustment at school. Additionally, we sought to investigate the mediating role of persistence and effort, in the relation between students' proactive coping and their deep processing. Hence, the two research main research questions of the current study were: (a) Does autonomous motivation predicts increased proactive coping in the academic domain? and (b) Do persistence and effort mediate the relationship between proactive coping and deep processing? If persistence and effort mediates the path between proactive coping and deep processing, this would highlight the functional centrality of engagement forms in determining deep processing and implicit adjustment at school. **Figure 1** presents the hypothesized paths diagram of the relationships between the variables mentioned in the preceding discussion and the hypothesized mediation. On the basis of the arguments presented, the following specific hypotheses were advanced.

METHODS

Aims and Hypothesis

The study explored the predictors of adjustment at school within a model including coping strategy, motivation, and engagement in learning and SRL among adolescent students. The purpose of the present study is to explore

how these two dimensions relate to and predict: (a) adolescents' coping strategy, (b) their engagement in learning, (c) strategy for learning which they use in study and implicit (d) adjustment at school.

Figure 1 presents a path diagram of the relationships between the variables mentioned previous.

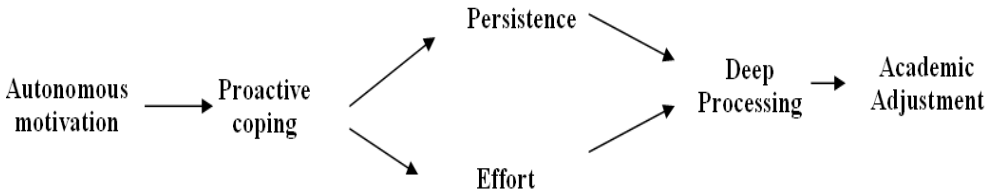

Figure 1. Integrated theoretical models

The following specific hypotheses were advanced:

Hypothesis 1: Autonomous motivation will produce stronger proactive coping strategy.

Hypothesis 2: Proactive coping will exert a positive effect on effort and persistence, whereas effort and persistence will exert positive effects on deep learning and adjustment at school.

Hypothesis 3: Effort, persistence will operate as mediators between the proactive coping and strategy for learning

Hypothesis 5: Strategy for learning (deep processing) will operate as mediators between engagement in learning and adjustment at school.

Participants

The sample included 154 adolescents, attending nine classes in four schools from Cluj-Napoca. The mean chronological ages were 16.7 (SD = .74) and 79 was female. All participants were in the 10th grade. There were no substantial differences across schools with respect to previous grades.

Measures

Multidimensional academic motivation. *Academic Motivation Scale (AMS;* Vallerand, Pelletier, Blais, Brière, Senécal & Vallières, 1992). The scale is composed of 20 items grouped in five subscales corresponding to the motivational types proposed by SDT (Deci & Ryan, 1985, 2000): *Intrinsic Motivation to Know,*

Identified Regulation, Introjected Regulation, External Regulation, and *Amotivation*. The subscales can be combined to form an autonomous motivation composite (intrinsic motivation + identified regulation) (α= .65) and a controlled motivation composite (introjection + external regulation) (α= .77) (Sheldon, Ryan, Deci & Kasser (2004).

Coping. The Proactive Coping Inventory (PCI): The PCI (Greenglass, Schwarzer & Taubert, 1999) is a multi-dimensional instrument that contains 44 items and seven subscales: The Proactive Coping Scale, Reflective Coping Scale, Instrumental Support, Preventive Coping, Strategic Planning, Emotional Support Seeking and Avoidance Coping (Greenglass, 2002). In our study we used only subscale one, because it is an exclusive measure of proactive coping. It assesses an individual's general coping style, rather than assessing reactions to a particular stressor. *The Proactive Coping Scale* consists of 14 items and combines autonomous goal setting with self-regulatory goal attainment cognitions and behaviors (α= .85). Respondents were asked to answer how well each statement described the reactions they had to various situations, with responses made on a 4-point scale, ranging from (1) "Not at all true" to (4) "Completely true". Sample items include "I am a 'take charge' person", and "When I experience a problem, I take the initiative in resolving it". The subscale had high internal consistency, with a Cronbach alpha of .82.

Effort and Persistence. Effort was measured using three items from Elliot McGregor & Gable (1999) and two items from the MSLQ (Pintrich & Groot, 1990). Four items from Elliot et al.'s (1999) scales were used for the persistence variable. Reliability estimates (Cronbach's alpha) were .76 for the effort scale and .89 for the persistence.

Strategy use. *Deep processing* was assessed with a measure devised by Elliot, et al. (1999). Four cognitive scales on the MSLQ (Pintrich, Smith, Garcia & McKeachie, 1991) should be related to *deeper approaches* to learning or more transformative, critical thinking, or regulative styles (Vermunt, 1996).

Adjustment at school. To assess adjustment at school, we selected a range of outcome measures to reduce the influence of potential item overlap between any single measures of adjustment. The first measure, the Index of Well-Being (Campbell, Converse & Rogers, 1976), asks respondents to rate "how you feel about your present life school" on 11 seven-point semantic differential items (e.g., *boring–interesting* and *full–empty*). The second measure, self-reported adjustment at school, was assessed with six items developed by

Aspinwall & Taylor (1992). Three items asked students to compare their happiness with that of the average colleagues at the school and to compare their overall adjustment at school with the average colleagues on 5-point scales (e.g., "Compared to the average colleague, how happy do you think you are?" 1 = *much less happy* to 5 = *much happier*). Next, students were asked to rate their academic adjustment and overall adjustment (eg., "Overall, how well do you think you've adjusted to school?"), the extent to which they felt they belonged at the school (two items), and their satisfaction with the school on 7-point scales. The third measure is educational aspirations. A single statement was designed to measure students' future intentions regarding their studies. Participants were asked "Until when do you intend to go to school?" and they had to choose between two answers: (a) Until I have a secondary school diploma, (b) Until I have a university diploma.

An a priori measurement model for three latent variables was estimated by allowing each indicator to load on only one latent construct. The Index of Well Being, the satisfaction with the school measure and educational aspirations was used to indicate a latent *adjustment at school* factor. Thus, we combined the three previous measures for obtain a global measure of adjustment at school. The Cronbach's alpha coefficient for this measure was .58. A higher score on academic adjustment indicates indicated more successful adjustment at school and implicit, that students had higher well-being and adjustment index, and that they wanted to continue their studying past the high school diploma.

Procedure

Participants were evaluated at their school. Each participant was given an information booklet which contained all above-mentioned scales evaluating variables of the study. Participants were instructed to provide honest answers on each scale.

Results

Means, standard deviations, and intercorrelations of all variables used in study are presented in **Table 1**. Scale and indicator reliabilities (alphas) are included on the diagonal of Table 1. The reliability indices for the complete scales are shown in brackets. Bivariate correlations were computed employed in order to depict the interrelations among all study variables. The correlation matrix shown in Table 1 reveals the relations among the predictors, mediator, and criterion variables.

Table 1. Descriptive statistics and intercorrelations among Autonomous Motivation, Proactive Coping, Engagement in learning, processing and Adjustment at school

	M(SD)	1	2	3	4	5	6
1. Autonomous Motivation	3.41(.65)	-					
2. Proactive Coping	40.1(6.71)	.44**	-				
3. Persistence	5.07(1.72)	.09	.12*	-			
4. Effort	4.21(1.37)	.13*	.09	.40**	-		
5. Deep Processing	3.88(.89)	.12*	.04	.08		-	
6. Adjustment at School	2.63(.85)	.06	-.07	.12*	.07	.36**	-

* = p<.05, ** = p<.01

The path analyses employed in the present investigation rely on assumptions including linearity, causal closure, and unitary variables. In this respect, the assumption of linearity was verified by conducting the correlation analysis. In order to perform a path analysis Wright (1968) suggested the assumption of causal closure, referring to the fact that all direct influences of one variable on another must be included in the path diagram. Finally, the assumption of unitary variables was tested by verifying that variables did not comprise components that behave in different ways with different variables.

Linear regression analyses revealed that autonomous motivation was a positive predictor of proactive coping, β = .27, 95% CI [.11, .47]. $F(1, 149) = 5.28$, $p < .05$, whereas proactive coping positively predicted persistence, β = .21, 95% CI [.18, .36], $F(1, 149) = 11.97$, $p < .01$, and effort, β = .34, 95% CI [.16, .44], $F(1, 149) = 19.81$, $p < .01$. In accord with the posited structural model, results indicate that deep processing was positively predicted by persistence β = .24, 95% CI [.13, .40]. *F(1, 149) = 4.37,* p *< .05 and effort β = .21, 95% CI [.16, .39].* F*(1, 149) = 5.28,* p < .05. Furthermore, the regression procedure revealed that adjustment at school was positively predicted by deep processing, β = .18, 55% CI [.09, .37], $F(1, 149) = 4.84$, $p < .05$.

Finally, this model suggests that the effect of positive coping on academic adjusting is mediated by persistence, effort, and deep processing, with a remaining direct effect on academic adjusting.

The relationships among the variables also served to test for multicollinearity. The results showed that none of the partial coefficients exceeded .50, suggesting that the multicollinearity among the study variables was relatively low (Tabachnick & Fidel, 2001). The variance inflation factor (1.00–1.24) and tolerance (0.80–1.00) statistics also resided within acceptable ranges.

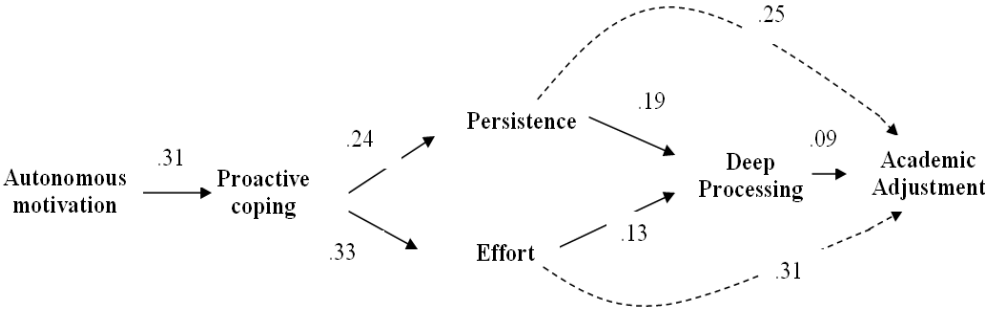

Figure 2. The final model depicting the relationships among variables. Solid path coefficients represent standardized regression coefficients, while dotted paths represent significant path which not-figure in first model. All paths represent significant effects ($p < .05$ at minimum).

Theoretical relationships. In order to examine theoretical relationships among dependent, independent, and mediating variables proposed in the hypotheses, we used the AMOS Version 19.0. The hypothesized model (Figure 1) was initially tested for the data. This analysis was conducted to determine the goodness of the model fit to the data. The fit statistics obtained from the last path analysis showed that the value of $\chi 2$ (5, $N = 154$) was 7.68, $p > .05$ which indicated a good fit. Besides the $\chi 2$ value, its ratio to degrees of freedom was also calculated. The value of this ratio was $\chi 2$ /df = 7.68 / 5 = 1.53 which implied a good fit given that, generally, values of less than 2 are accepted as a good fit (Tabachnick & Fidell, 2007). The other important goodness of fit statistics that were calculated for the present study was RMSEA, GFI, AGFI, and NFI. The results of the present analysis showed that RMSEA value was .02, GFI values was .98, AGFI was .99 and NFI was found to be .98. These multiple indices also confirmed the adequacy of the model fit. The final model we obtained using the tests of the nested models, including the standardized path loadings, is shown in Figure 2.

Discussion

Results from the present study provide insight into the relationships between motivational components, coping strategy, engagement in learning (effort, persistence,) deep processing and adjustment at school. Using SDT approach, a mediation model was tested in which autonomous motivation was proposed to predict active coping strategy, effort and persistence, deep processing and adjusted at school. Students with the high autonomous motivation engaged in more active coping strategy.

Autonomous motivation (i.e., intrinsic regulation and identified regulation) strongly predicted active coping strategy. Although this finding is not new, the use of path analysis provides convergent support for the importance of autonomous motivation as a precursor of active coping strategy. Research has shown this form of motivation to be accompanied by the experience of choice rather than by pressure and by proactive coping and well-being (Grolnick & Ryan, 1989; Ryan, Rigby & King, 1993). According to SDT, autonomous motivation for learning should be positively associated with feelings of personal accomplishment. In fact, the link between autonomous motivation and personal accomplishment is a basic tenet of SDT (e.g., Ryan & Deci, 2000). SDT and research based on it suggest that autonomous motivation is accompanied by feelings of vitality and energy that are the opposite of feeling drained and exhausted (Niemiec et al., 2006). Consistent with these findings, we posited that because autonomously motivated students perceive their engagement in various tasks as interesting and meaningful, they will experience less exhaustion. Thus, students' sense of autonomy at school may allow them to tolerate occasional frustrations and setbacks and to prevent those negative experiences from leading to feelings of exhaustion and loss of vitality and this is a good prerequisite experiencing a proactive coping. If students believe that their schoolwork is important and meaningful, these commitments may serve as energetic anchors, especially if other aspects of their motivational systems are fragile. Because of the energy and organization that purposefulness provides to the whole motivational system, researchers recognize it as key to students' academic resilience (Morrison & Allen, 2007).

In line with our expectations, proactive coping positively predicted behavior engagement. Adaptive coping strategies (such as problem solving, information seeking, and self-encouragement) seem to provide both guidance and a boost of energy towards those ends (Boekarts & Niemivirta, 2000). When students run into difficulties, they can cope in ways that allow them to keep going despite worry or frustration (such as through help-seeking or self-encouragement), or that allow them to regain their enthusiasm for challenging tasks (such as through problem solving). Hence, constructive coping may be keys to engagement in learning. Constructive coping (including self-encouragement and determination) allows students to persist the face of difficult school tasks. So, students whose coping repertoires comprised adaptive strategies were increasingly likely to persist in the face of problems and implicit use of metacognitive strategies (deep processing). Student engagement is a motivationally enriched classroom quality that has clear implications for student's adjustment at school (Skinner, Kindermann, Connell & Wellborn, 2009). By engaging themselves actively and enthusiastically in academic activities, students learn, develop skills, and

generally make academic progress. Consequently, both the extent and quality of students' classroom engagement have been shown to predict various aspects of adjustment at school, including satisfaction with one's academic life (Ladd & Dinella, 2009; Mih, 2013).

As expected effort and persistence was a significant individual predictor of deep processing. It appears that students who make effort in solve school task were more cognitively and metacognitively engaged in trying to learn the material. These findings parallel the work of Pintrich & De Groot (1990), who found that effort, was strongly related to students' use of cognitive strategies and metacognitive self-regulation. There are both surface and deep approaches to learning (Savin-Baden & Major 2004). Surface approaches to learning concentrate on memorization. In surface learning, the learner's goal is often to complete required learning tasks by memorizing information needed for assessments. Surface learners mostly focus on facts without integration, they are generally unreflective, and they see learning tasks as external impositions. In contrast, students with *deep approaches to learning* have an intention to understand. They generally engage in interaction with content, relate new ideas to old ones, relate concepts to everyday experience, relate evidence to conclusions, and examine the logic of arguments. While doing this, they construct their own knowledge, understand and comprehend information in a more analytical manner. Interest and learn subject contents in a deep may facilitate learners to engage more in their own conscious beliefs, and this lead to satisfaction with one's academic life and implicit intentions of continuing one's schooling, satisfaction with one's academic life and satisfaction with the school.

Results from the present study suggest some preliminary implications for educational practice. Using this simple, proactive approach, teachers could gain important insights and know ahead of time which students are likely to need more help regulating their learning experience. Nonetheless, educators can design their courses in a way that enhances both effort and persistence to complete school tasks. For example, students' effort can be promoted in several ways, including guiding and encouraging students to set challenging, proximal goals and scaffolding students' metacognitive self-regulation by providing them with timely, honest, and explicit feedback (Pintrich & Schunk, 2002). Although none of these suggestions are unique to learning, they are considered by many to be "best practices" for all educators.

Future research should continue to explore the relationships between students' engagement characteristics, their use of cognitive and metacognitive learning strategies, and, ultimately, their academic adjustment. The use alternative research methods, such as experimental study, might be especially useful in exploring the relations between students' reported level of self-regulation and the extent to which deep processing and knowledge construction. These findings suggest that future research should investigate whether interventions designed

to enhance motivation (effort and persistence) and scaffold self-regulation can also improve adjustment at school (satisfaction with one's academic life, belonged at the school, satisfaction with the school intentions of continuing one's schooling and educational aspirations).

Limits

Several limitations of the present investigation should be noted. First, the present sample consisted primarily of adolescent high-school students. It would be important to further analyze whether the current findings can be generalized to younger student populations, who are perhaps less able to grasp the future consequences of their current behavior. Second, the correlational and cross-sectional nature of this study does not allow us to draw any causal inferences. The variables were concurrently measured and a more accurate test of the mediating processes would imply presumed antecedents and consequents to be assessed within a sufficient temporal interval. Future longitudinal studies may help to further examine the direction of the effects. Thus, we cannot infer causality from cross-sectional data, but, viewed in light of prior theory and research, the present study suggests that the proactive coping strategy helps adolescents to academic adjustment. Future longitudinal research may also assess the causal effect of the adoption of specific coping responses on subsequent engagement in learning and adaptation at school and other variables. Lastly, the present study did not evaluate the role of other relevant aspects, such as socioeconomic status, dispositional coping style, causal attributions, and the controllability of stressors, on the adoption of coping responses when facing academic adjustment. Future research may evaluate their role in predicting the choice of proactive coping strategy.

Conclusion

In sum, consistent with social cognitive models of SRL (Pintrich, 2000; Zimmerman, 2000), findings support the view that students' use of learning strategies in learning can be explained, in part, by autonomous motivation, by proactive coping and by engagement in learning (effort and persistence). Findings from the present study support prior research indicating that students' engagement in learning is related to their use of self-regulated learning strategies in academic settings (Pintrich, 2000). Specifically, students' effort and persistence were significant positive predictors of their reported use of deep processing (elaboration, critical thinking, and metacognitive strategies).

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