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Coping with examinations: Exploring relationships between students’ coping strategies, implicit theories of ability, and perceived control

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Background. Relatively little is known about the contribution of students’ beliefs regarding the nature of academic ability (i.e. their implicit theories) on strategies used to deal with examinations.

Aims. This study applied Dweck’s socio-cognitive model of achievement motivation to better understand how students cope with examinations. It was expected that students’ implicit theories of academic ability would be related to their use of particular coping strategies to deal with exam-related stress. Additionally, it was predicted that perceived control over exams acts as a mediator between implicit theories of ability and coping.

Sample. Four hundred and ten undergraduate students (263 males, 147 females), aged from 17 to 26 years old (M = 19:73, SD = 1.46) were volunteers for the present study.

Methods. Students completed measures of coping, implicit theories of academic ability, and perception of control over academic examinations during regular classes in the first term of the university year.

Results. Multiple regression analyses revealed that incremental beliefs of ability significantly and positively predicted active coping, planning, venting of emotions, seeking social support for emotional and instrumental reasons, whereas entity beliefs positively predicted behavioural disengagement and negatively predicted active coping and acceptance. In addition, analyses revealed that entity beliefs of ability were related to coping strategies through students’ perception of control over academic examinations.

Conclusions. These results confirm that exam-related coping varies as a function of students’ beliefs about the nature of academic ability and their perceptions of control when approaching examinations.

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Academic examinations, as with many evaluative situations, play an important role in students’ academic and occupational pathways (Zeidner, 1995). Accordingly, a great deal of research has focused on how students cope with ego-threatening aspects of examinations (Carver & Scheier, 1994; Folkman & Lazarus, 1985; Zeidner, 1995).

Past studies have shown that students may use different kinds of strategies to face exam-related stress. These strategies can be categorized as problem-focused, involving activities centred on changing the stressful situation (e.g. planning), or emotion-focused, involving activities centred on modifying one's reactions to stressful situations (e.g. positive reinterpretation; Carver & Scheier, 1994; Folkman & Lazarus, 1985; Rovira, Fernadez-Castro, & Edo, 2005). While problem-focused coping responses have been proposed to alleviate the negative impact of stress and yield more positive outcomes, certain emotion-focused coping responses have been viewed as maladaptive because they may lead one to disengage from the task, (e.g. behavioural disengagement) and as a result exacerbate the effects of stress and yield less positive consequences (Compas, Connor-Smith, Saltzman, Thomsen, & Wasworth, 2001).

Students’ coping strategies are central in the academic setting, given that they influence approaches to studying during exam preparation (Moneta, Spada, & Rost, 2007), adjustment to college (Aspinwall & Taylor, 1992), positive and negative exam-related affect (Carver & Scheier, 1994; Folkman & Lazarus, 1985), and school failure (Mantzicopoulos, 1990). When preparing for exams, students using problem-focused strategies are more likely to adopt deep and strategic approaches to studying, resulting in less negative and more positive affects, whereas students using disengagement-oriented coping strategies tend to adopt a surface approach to studying, resulting in more negative and less positive affects (Appelhans & Schmeck, 2002; Moneta et al., 2007). Thus, in the academic context, when approaching examinations, it is adaptive to engage in active problem-focused coping strategies, such as planning, active coping, seeking social support for instrumental reasons rather than maladaptive coping strategies, such as behavioural disengagement, denial, blame, distraction (Carver, Scheier, & Weintraub, 1989). Given their different outcomes, identification of the determinants of students’ adaptive versus maladaptive coping strategies is an important area for research in educational psychology.

Existing studies have emphasized that students’ coping strategies vary as a function of anxiety style (Rafety, Smith, & Ptacek, 1997), extraversion and neuroticism (Gallagher, 1996), level of self-esteem, optimism and psychological control (Aspinwall & Taylor, 1992). In addition, coping strategies can also vary as a function of gender (for a review, see Tamres, Janicki, & Hedgeson, 2002). However, the mechanisms that lead students to use particular strategies require more detailed inquiry.

As Lazarus (1999) highlighted, coping actions may also vary according to individuals’ beliefs in a particular context. In this regard, one particularly relevant model in the academic context is the socio-cognitive model of motivation and achievement (Dweck, 1986; Dweck & Leggett, 1988). A central premise of this theoretical framework is that individuals differ in their beliefs about the fundamental nature of ability (i.e. their implicit theories). Specifically, ability may be considered as a fixed entity that cannot be changed (i.e. entity beliefs) or a malleable quality that can be increased through one’s efforts (i.e. incremental beliefs). In the educational setting, students’ incremental beliefs about the nature of ability are posited to promote adaptive responses, whereas entity beliefs would lead to less adaptive outcomes (Dweck, Chiu, & Hong, 1995). Incremental beliefs lead to the use of strategies aimed at solving the problem when students face difficulties, such as increased effort, persistence, and preference for challenge
(for a review, see Dweck, 1996; Kamishis, Miller, & Marcussen, 1996). Viewing ability as malleable has also been found to be negatively associated with worry and the use of strategies aimed at avoiding demonstrations of low ability (Cury, Da Fonseca, Zahn, & Elliott, 2008). Given this, incremental beliefs of ability may be related to adaptive strategies, such as active coping to face examinations. In contrast, entity beliefs may be posited to lead to maladaptive responses and behaviours in achievement settings, including helpless responses to failure (Dweck et al., 1995), low task persistence, decreased effort when the demands of the task increase, and shying away from challenge (Ommusden, Haugen, & Lund, 2005). Thus, entity beliefs of ability tend to be associated with maladaptive coping strategies such as disengagement or denial.

While the links between implicit theories and adaptive versus maladaptive outcomes have received a good deal of support, relatively little is known about their relationships with students’ coping in the academic setting. Interestingly, the relationship between implicit theories and coping has previously been investigated in the context of romantic relationships (Knee, 1998). The results showed that in response to negative relationship events, an incremental view of relationships was positively associated with several relationship-maintenance strategies such as active coping, planning, suppression of competing activities and positive reinterpretation. In contrast, an entity view of relationships was associated with behavioural disengagement and resistant coping strategies. Thus, Knee’s research suggests that the implicit theories developed by an individual regarding a given context could be related to the adoption of distinct strategies of coping.

The present study also focuses on students’ perception of control over exam situations as a potential mediator of the relationship between implicit theories and coping strategies. According to the transactional approach (Lazarus & Folkman, 1984) and recent research (Cheng & Cheung, 2005), perceived control is a key factor in appraisals of stressful events, and influence the individual’s choice of coping strategies. Individuals who perceive events as controllable are more likely to use problem-focused coping strategies, whereas individuals who perceive events as uncontrollable may use emotion-focused and disengagement oriented strategies (Roussi, Miller, & Shoda, 2000). Moreover, cognitive appraisal of control could mediate the contribution of individual factors, such as implicit theories, on coping (Lazarus & Folkman, 1984). The present study suggests that implicit theories of ability could lead one to adopt different coping strategies, in part through different perceptions of control over examinations. Individuals holding a theory of ability as stable may perceive a lack of control over exams, because they consider their ability as fixed and difficult to improve to match examination demands, leading to maladaptive coping. Conversely, people holding a theory of ability as malleable could perceive that they are in control in exam situations because in their view, ability could be improved and modified to match examination demands, leading to adaptive coping.

**Purpose and hypotheses**

Drawing upon the social-cognitive model of achievement and motivation (Dweck, 1986; Dweck & Leggett, 1988), the present study sought to explore the relationships between students’ beliefs regarding the nature of ability and the coping strategies used to deal with examinations. Based on existing work (e.g. Knee, 1998) and on the academic outcomes associated with implicit theories, it is first hypothesized that incremental beliefs of ability are positively associated with adaptive coping strategies that reflect
attempts to deal with exams whereas entity beliefs of ability are positively associated with maladaptive forms of coping strategies reflecting disengagement from exams. It is further hypothesized that the relationships between implicit theories and coping strategies are also partially mediated by perceived control over exams – positively for incremental beliefs and negatively for entity beliefs.

Method

Participants
A sample of 433 university undergraduate students enrolled in a sport and exercise science course volunteered to participate in the study. Among them, 23 students did not provide complete data. Hence, the final sample comprised 410 participants (263 males and 147 females), aged from 17 to 26 years old ($M = 19.73, SD = 1.46$).

Measures

Coping strategies
Coping was assessed with the French version (Muller & Spitz, 2003) of the brief COPE (Carver, 1997). This measure assesses distinct coping strategies with two-item subscales, including problem-focused strategies (active coping, planning, seeking social support for instrumental reasons, and acceptance), and emotion-focused coping considered either adaptive (seeking social support for emotional reasons, positive reinterpretation, humour, venting of emotions), or maladaptive such as disengagement-oriented strategies (behavioural disengagement, denial, blame, and distraction). The religion and substance use subscales were excluded from the questionnaire because they were considered irrelevant in the academic setting (Rovira et al., 2005). Participants were asked to rate on a four-point scale (from 1 ‘not at all’ to 4 ‘usually’) the extent to which they generally use each of the strategies described in order to manage examinations. Cronbach’s $\alpha$ ranged from .50 to .79 (see Table 1).

Perception of control
In line with Cheng and Cheung (2005), students’ perception of control over the exam situation was assessed through a single item, asking how much control they thought they generally had over examinations. Responses were made on a seven-point scale ranging from 1 (‘no control at all’) to 7 (‘complete control’).

Implicit theory
The six-item measure developed by Cury et al. (2006) was used to assess implicit theories of ability. Three items assess entity beliefs (e.g. ‘One has a certain level of ability in class and there is not much that one can do to change it’) and three items assess incremental beliefs (e.g. ‘If one works hard and often, one can change one’s level of ability in class’). Students responded on a five-point scale from 1 (‘strongly disagree’) to 5 (‘strongly agree’). Cronbach’s $\alpha$ was .60 for entity beliefs and .66 for incremental beliefs (see Table 1).

Procedure
The instrument was administered to students during regular classes in the first term of the academic year. They were informed that the purpose of the study was to investigate
how students approach and deal with examinations. They were also informed that their responses would be treated anonymously. Instructions to self-complete the instrument were provided in written form. Completed instruments were collected at the end of class and returned to the researcher.

Data analysis

Separate multiple regression analyses were first conducted with each coping strategy as criterion, and the two implicit theories of ability as predictors. The hypothesis regarding the mediating role of perceived control was tested using the traditional Baron and Kenny (1986) approach to mediation, with a regression framework with measured variables: (a) regression of perceived control on implicit theories, (b) regression of coping strategies on perceived control, (c) regression of coping strategies on implicit theories, and (d) regression of coping strategies on implicit theories when perceived control was controlled. A mediating effect of perceived control was assumed if (1) significant links were found in the first three analyses and (2) the relationship between implicit theories of ability and coping strategies was significantly reduced when perceived control was introduced into the analysis. In each analysis, the two implicit theories of ability were entered simultaneously. Perceived control and both implicit theories of ability were mean-centred before being entered in the analysis to reduce collinearity (Aiken & West, 1991). Gender was entered as a control variable in each analysis given its potential influence on coping (for a review, see Tamres et al., 2002).

Results

Means and standard deviations for all variables are presented in Table 1. Students in this sample are more inclined towards incremental beliefs of ability than entity beliefs.
The pattern of correlations was generally as expected (see Table 2): incremental beliefs of ability were correlated positively with active coping, planning, seeking social support for instrumental reasons, acceptance, seeking social support for emotional reasons, venting of emotions and negatively with humour. Entity beliefs of ability were positively correlated with behavioural disengagement and negatively correlated with active coping and acceptance.

**Relationships between implicit theories and coping strategies**

Regression analyses revealed that incremental beliefs of ability significantly and positively predicted problem-focused strategies, such as active coping, planning, acceptance, seeking social support for instrumental reasons and emotion-focused strategies such as seeking social support for emotional reasons and venting of emotions (see Table 3). Entity beliefs of ability positively predicted behavioural disengagement and negatively predicted active coping and acceptance. One must be cautious about the significant contribution of entity beliefs on venting of emotion (see Table 3). No significant relationships were found between implicit theories and denial, positive reinterpretation, blame, humour, and distraction.

**Mediations role of perceived control between implicit theories and coping strategies**

Having established the links between implicit theories and coping strategies, the potentially mediating role of perceived control was examined. Separate multiple regression analyses, with gender entered in the first step, demonstrated that entity beliefs of ability were significantly associated with perceived control, whereas no significant contribution of incremental beliefs was found (see Table 3). Thus, perceived control cannot be considered as a significant mediator of the relationships between incremental beliefs and coping strategies. The subsequent regression analyses revealed significant relationships between perceived control and active coping, acceptance, and behavioural disengagement, but no significant relationship with venting of emotions.\(^1\)

Having established that entity beliefs contributes significantly to active coping, acceptance, venting of emotions, behavioural disengagement, and perceived control, and that perceived control significantly predicts active coping, acceptance, and behavioural disengagement, further analysis were conducted to determine if perceived control mediates the relationships between entity beliefs and these strategies. When introducing perceived control into the regression analysis, the significant link previously found between entity beliefs and active coping no longer exists (Sobel’s test, \(z = 23.18, P < .01\)) – and nor does the previously significant link between entity beliefs and acceptance (\(z = -3.18, p < .01\)). When perceived control was introduced into the analysis, the link previously found between entity beliefs and behavioural disengagement was significantly reduced (\(z = 2.76, p < .01\); see Table 4).\(^2\)

All significant findings (and non-significant findings of relevance to the mediation question) are presented in Figure 1.

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\(^1\) Additional regression analyses were conducted to test the extent to which gender moderated the relationship between implicit theories and coping strategies. Results indicated no significant gender \(X\) incremental beliefs and no significant gender \(X\) entity beliefs interaction.

\(^2\) Additional analyses revealed no significant control \(X\) incremental beliefs and no significant control \(X\) entity beliefs interaction.
Table 2. Correlation Matrix (N = 410) between the variables used in the analysis

<table>
<thead>
<tr>
<th>Variables</th>
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<td>-0.13**</td>
<td>0.02</td>
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<td>(5) SSS for emotional</td>
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<td>(8) Denial</td>
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<td>(10) Humor</td>
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Note. *p <= .05; **p <= .01; ***p <= .001. SSS, seeking social support. Gender was coded as 0 = female and 1 = male.
Table 3. Summary of regression analyses of coping strategies and perceived control on implicit theories (N= 410)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Active coping</th>
<th>Planning</th>
<th>SSS for instrumental reasons</th>
<th>Acceptance</th>
<th>SSS for emotional reasons</th>
<th>Venting of emotions</th>
<th>Behavioural disengagement</th>
<th>Perceived control</th>
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<tbody>
<tr>
<td>Gender</td>
<td>-0.03</td>
<td>-0.07</td>
<td>-0.20***</td>
<td>0.06</td>
<td>-0.26***</td>
<td>-0.21***</td>
<td>-0.06</td>
<td>-0.01</td>
</tr>
<tr>
<td>Incremental beliefs</td>
<td>0.17***</td>
<td>0.21***</td>
<td>0.16***</td>
<td>0.09</td>
<td>0.16***</td>
<td>0.11*</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Entity beliefs</td>
<td>-0.11*</td>
<td>-0.04</td>
<td>0.05</td>
<td>-0.12*</td>
<td>0.08</td>
<td>0.10*</td>
<td>0.20***</td>
<td>-0.22***</td>
</tr>
<tr>
<td>F(3, 406)</td>
<td>7.40***</td>
<td>8.09***</td>
<td>10.46***</td>
<td>4.15**</td>
<td>15.23***</td>
<td>10.04***</td>
<td>7.09***</td>
<td>7.03***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.04</td>
<td>0.05</td>
<td>0.06</td>
<td>0.03</td>
<td>0.09</td>
<td>0.06</td>
<td>0.04</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Note. Data in table are standardized coefficients. *p < .05; **p < .01; ***p < .001. SSS, seeking social support. Gender was coded as 0 = female and 1 = male.
Table 4. Summary of regression analyses of coping strategies on implicit theories and perceived control (N = 410)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Active coping</th>
<th>Planning</th>
<th>SSS for instrumental reasons</th>
<th>Acceptance</th>
<th>SSS for emotional reasons</th>
<th>Venting of emotions</th>
<th>Behavioral disengagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-0.03</td>
<td>-0.07</td>
<td>-0.20***</td>
<td>0.06</td>
<td>-0.26***</td>
<td>-0.21***</td>
<td>-0.06</td>
</tr>
<tr>
<td>Incremental beliefs</td>
<td>0.17***</td>
<td>0.21***</td>
<td>0.16***</td>
<td>0.09</td>
<td>0.16***</td>
<td>0.11*</td>
<td>0.04</td>
</tr>
<tr>
<td>Entity beliefs</td>
<td>-0.08</td>
<td>-0.01</td>
<td>0.03</td>
<td>-0.07</td>
<td>0.07</td>
<td>0.10*</td>
<td>0.16***</td>
</tr>
<tr>
<td>Perceived control</td>
<td>0.15**</td>
<td>0.13**</td>
<td>-0.10*</td>
<td>0.18***</td>
<td>-0.07</td>
<td>0.01</td>
<td>-0.15***</td>
</tr>
<tr>
<td>F(4, 405)</td>
<td>8.09***</td>
<td>8.10***</td>
<td>9.12***</td>
<td>6.63***</td>
<td>12.05***</td>
<td>7.52***</td>
<td>7.84***</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.06</td>
<td>0.06</td>
<td>0.07</td>
<td>0.05</td>
<td>0.09</td>
<td>0.06</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note. Data in table are standardized coefficients. *p < .05; **p < .01; ***p < .001. SSS, seeking social support. Gender was coded as 0 = female and 1 = male.
Figure 1. Relationships between implicit theories, perceived control, and coping strategies. Coefficients in brackets refer to relationships between entity beliefs and coping strategies prior to inclusion of perceived control.

Discussion
Drawing upon the socio-cognitive model of achievement and motivation (Dweck, 1986; Dweck & Leggett, 1988), the present research sought to identify the contribution of implicit theories of ability to students’ coping strategies approaching exam situations. Results showed that the more students held incremental beliefs regarding the nature of ability, the more they used problem-focused forms of coping such as active coping, planning, and seeking social support for instrumental reasons. These findings confirmed our hypothesis and are in line with previous research conducted in the non-academic domain (Knee, 1998). They also complement existing knowledge concerning the behavioural outcomes of incremental beliefs about ability. Thus, it is likely that the tendency to increase effort as task difficulty increases – which has been related to incremental beliefs in previous research (Cury et al., 2008) – could be considered a form of active coping with exam situations. In addition, incremental beliefs of ability were positively related to emotion-focused forms of coping such as seeking social support for emotional reasons and venting of emotions to deal with examinations. Thus, holding an incremental view of ability seems to be associated with the use of diverse coping strategies. Specifically, students viewing ability as malleable seem to use a broader repertoire of coping strategies to respond to the demands of examinations. As Zeidner (1995) and Sideridis (2006) highlighted, adaptive coping and adequate management of exam situations involves a flexible and combined use of coping strategies, including problem-oriented and emotion-oriented forms of coping. A broad repertoire along
these lines may equip students with more choices to handle a wider range of academic tasks and is proposed as an effective way to manage stress rather than responding with a limited range of strategies to changing stressful circumstances (Cheng & Cheung, 2005).

The results also showed that entity beliefs of ability are related to a tendency to disengage from exams. This dimension predicted the use of behavioural disengagement and was negatively related to acceptance and active coping, confirming our hypothesis and previous studies (Knee, 1998). These disengagement-oriented coping responses are maladaptive because they may exacerbate the effects of stress (Compas et al., 2001). Moreover, the negative relationships with acceptance and active coping reflect the avoidance of challenging situations and the reduction of effort related to entity beliefs (Dweck et al., 1995). Entity beliefs of ability may lead individuals to shy away from effort and challenge to focus on validating and protecting their sense of ability at the expense of learning (Cury et al., 2008), a form of behavioural disengagement. Moreover, compared to incremental beliefs of ability, entity beliefs of ability are associated with a limited repertoire of strategies characterized by rigid or disorganized approaches (Skinner, Edge, Altman, & Sherwood, 2003) that might interfere with active coping (Carver et al., 1989). Interestingly, entity and incremental beliefs did not significantly contribute to denial, positive reinterpretation, blame, humour, and distraction. One explanation could be that these strategies have not clear implications for study strategies and behaviour. Beliefs about the nature of ability are likely to relate to coping strategies that are relevant to study and exam-related strategies such as active coping or planning.

The results from the mediation analyses further revealed that students’ perception of control over exam situations acts as a significant mediator of relationships between entity beliefs of ability and behavioural disengagement, acceptance and active coping, partially supporting our second hypothesis. This result seems to indicate that holding a theory of ability as stable and fixed is related to the adoption of maladaptive coping strategies, in part because it leads to low perceived control over exams. More precisely, believing that ability is fixed could imply a belief that this ability cannot be improved to match the exams demands (i.e. low control), leading to disengagement from the situation and a reduction in effort. Surprisingly, students’ perception of control over exam situations did not mediate the relationship between incremental beliefs and coping strategies, suggesting that students holding an incremental view may be less permeable to situational influences when they are faced with examinations. Students holding a theory of ability as malleable may not need to perceive control over exam situations to deal with examinations. Alternatively, it may be that other relevant variables, such as achievement goals, mediate the relationship between incremental beliefs and coping strategies.

This study is amongst the first to emphasize the role of beliefs about the nature of ability in academic coping and thus progresses current understanding of the antecedents of coping strategies deployed to deal with examinations. Research is now needed to investigate the processes through which implicit theories and coping impact academic performance. The present study also contributes to a better understanding of the academic outcomes related to the socio-cognitive model of achievement (Dweck, 1986; Dweck & Leggett, 1988). From an educational perspective, the findings suggest that promoting incremental beliefs about the nature of ability is beneficial. Encouraging students adhere to the idea that ability is malleable and can be improved has the potential to foster the development and use
of problem-focused strategies, and in turn, help them to more efficiently manage exam-related stress. In addition, it seems important to help students who adopt entity beliefs to alleviate their concerns about the threat of failure, and assist them to perceive control over exam situations. Moreover, in order to help students deal with exam situations in more adaptive ways, it seems important to help them construct a broad repertoire of coping strategies that equips them to handle the demands of examinations.

The present study has demonstrated key links between implicit theories, control, and coping strategies. Notwithstanding this, there are some limitations that must be acknowledged when interpreting findings. First, the data were collected at one point in time, and therefore no causal links can be established here. Prospective studies are needed to examine the influence of initial implicit theories on the adoption of coping strategies when approaching examinations. In addition, some reliabilities were borderline and so findings should be interpreted with this in mind. Partly this was a function of scales having a relatively small number of items and alpha coefficients are notoriously sensitive to the number of items in a scale. It should also be noted that this study did not examine educational outcomes such as exam performance. In addition, it is recognized that correlations were generally low, as were beta coefficients. In the socio-cognitive model, implicit theories are distal factors and achievement goals are the specific channels through which they exert their influence on achievement behaviours (Dweck, 1986; Dweck & Leggett, 1988). Hence, future studies might test this contention by assessing students’ coping strategies through more proximal factors such as goal orientations or state anxiety. The results suggest that coping strategies, such as seeking social support for emotional and instrumental reasons, and venting of emotions, could also vary as a function of gender, with females reporting greater use of these strategies than males. Although gender effects were not the main purpose of the present study, this represents an interesting result which suggests the need for further research on gender and coping strategies in the academic setting.

To conclude, this study advances current understanding about students’ coping, implicit theories of ability, and perceptions of control in the examination context. Findings suggest there is merit in focusing on implicit theories of ability and control in attempts to better understand academic development and to better understand the factors that facilitate and impede students’ adaptation to stressful situations.

References


