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**HOW SELF-REGULATORY MODES AND PERCEIVED STRESS
AFFECT ACADEMIC PERFORMANCE**

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Abstract

Kruglanski et al. (2000) demonstrated how two self-regulatory modes, locomotion and assessment, underlie most goal-directed activity: locomotors are inclined to engage in initiating and maintaining any goal-directed activity, whereas assessors tend to compare and select among alternative desired end-states. These two motivational components were thought as interdependent aspects and considered as trait or state, thus influencing individuals' life activities. Previous research has shown the association between these self-regulatory modes and many aspects of goal pursuit, such as procrastination, time management, academic achievement (e.g., Chernikova et al., 2016), as well as self-esteem, optimism, anxiety, etc. (Pierro et al., 2008; Shalev & Sulkowski, 2009). The present study sought to analyze the association between self-regulatory modes, perceived stress, and academic performance. 492 Italian students ($M_{age} = 20.63$, $SD = 5.22$; 62.4% females) completed a questionnaire composed of a Socio-anagraphic section, the Locomotion and Assessment Scale, and the Perceived Stress Scale, during an exam session. Results revealed that the average marks were positively associated only to locomotion and that perceived stress was correlated negatively with locomotion and positively with assessment. Hence, the degree to which students perceived exams as stressful was determined by the way they regulated their goal-related activities. Consequently, developing specific strategies in academic environment could contribute to prevent the potential deleterious consequences of perceived stress.

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1. Introduction

According to the Self-regulation theory (Kruglanski et al., 2000), individuals implement two modes or strategies of self-regulation, that is, locomotion and assessment, to reach any goal-directed activity. The locomotion mode refers to “the aspect of self-regulation concerned with movement from state to state and with committing the psychological resources that will initiate and maintain goal-related movement”, whereas the assessment mode “constitutes the comparative aspect of self-regulation concerned with critically evaluating entities or states, such as goals or means, in relation to alternatives in order to judge relative quality” (Kruglanski et al., 2000, p. 794). These motivational components are thought as interdependent aspects, which may receive different emphasis by different persons and in different situations (Pierro, Pica, Mauro, Kruglanski, & Higgins, 2012). In this sense, they are considered as individual trait or state (Avnet & Higgins, 2003) that can influence daily life activities (Orehek, Mauro, Kruglanski, & van der Bles, 2012; Orehek, & Vazeou-Nieuwenhuis, 2013). Previous research has shown the association between the self-regulatory modes and many aspects of goal pursuit, such as procrastination, perseverance, time management, academic achievement, etc. (Chernikova, Lo Destro, Mauro, Pierro, Kruglanski, & Higgins, 2016). For example, locomotion was negatively associated with procrastination, that is, high locomotors tend to complete a task as quickly as possible and exhibit a greater ability to focus on a task without becoming distracted. On the contrary, assessment was positively correlated with procrastination: high assessors tend to procrastinate on tasks, are slower and more accurate in completing them, and care about potential mistakes during the task performance or the goal pursuit (Kruglanski et al., 2000; Mauro, Pierro, Mannetti, Higgins, & Kruglanski, 2009; Pierro, Giacomantonio, Pica, Kruglanski, & Higgins, 2011).

Further studies have assumed that both locomotion and assessment are necessary for successful task performance (Kruglanski, Pierro, Mannetti, & Higgins, 2013; Lo Destro, Chernikova, Pierro, Kruglanski, & Higgins, 2015). Findings gave evidence that cross-level complementarity resulted better in individual (Pierro et al., 2012) and in group performances (Mauro et al., 2009). Moreover, Lo Destro et al. (2015) have found differences in self-regulation modes in relation to the level of task complexity, i.e., high locomotion alone is sufficient to ensure a good performance on simple tasks, whereas both high locomotion and assessment are necessary for an optimal performance on complex tasks. In other words, as simple tasks do not require much information processing for a successful performance, they can be performed better by carrying out them speedily, thus a high assessment is not advantageous. Instead, complex tasks need a more extensive information processing as well as a speed performance, thus both high locomotion and high assessment are necessary (Lo Destro et al., 2015).

Locomotion and assessment self-regulatory modes have been also linked to well-being. Past research has revealed positive correlations between locomotion and psychological vitality, self-esteem, and optimism, and between assessment and low self-esteem, anxiety, depression, and ruminative tendencies (Kruglanski et al., 2000; Shalev & Sulkowski, 2009). That is, assessment-oriented persons tend to evaluate oneself constantly fostering a sense of inadequacy, negative emotions, lower self-esteem, and less optimism. Conversely, locomotion implies activation, proactivity, and forward-striving, thus providing more positive emotions, higher optimism, and self-confidence (Jimmefors, Garcia, Rosenberg, Mousavi, Adrianson, & Archer, 2014; Kruglanski, Pierro, Higgins, & Capozza, 2007). In this way, the

type of self-regulatory strategy seems to affect emotions, life satisfaction, and psychological well-being (Jimmefors et al., 2014).

2. Problem Statement

Generally, empirical research has focused on the relationship between self-regulatory processes, well-being, and academic performance, but instead, there is too scarce attention on the link between well-being and academic performance.

3. Research Questions

Academic performance was hypothesized to be predicted positively by both locomotion and assessment and negatively by the tendency to perceive life events as stressful.

4. Purpose of the Study

On the basis of these considerations, the current study aimed at investigating how academic performance was affected by individual differences in self-regulation modes and well-being in terms of perceived stress.

5. Research Methods

5.1. Participants and procedure

The sample was composed of 492 Italian high school graduates ($M_{age} = 20.33$, $SD = 4.51$; 42.1% males and 57.9% females). Data were collected during the exam sessions.

5.2. Measures

- The Locomotion and Assessment Scale (LAS; Kruglanski et al., 2000) was used to assess individual differences in self-regulation. The scale is made of two 12-item subscales designed to measure locomotion (e.g., “I am a doer”, “When I get started on something I usually persevere until I finish it”) and assessment (e.g., “I spend a great deal of time taking inventory of my positive and negative characteristics”, “I am a critical person”). Respondents rate on a 6-Likert scale (from 1 = strongly disagree to 6 = strongly agree) the extent to which they agree with each item. The scale showed good internal consistency with Cronbach’s alpha of .63 for Locomotion and .67 for Assessment.
- The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) assesses “the degree to which situations in individuals’ life are perceived as stressful” (p. 385). The instrument consists of 10 items rated on a five-point Likert scale from 1 = never to 5 = very often, covering the preceding month (“In the last month, how often have you felt nervous and “stressed”?”, “In the last month, how often have you felt that you were on top of things?”). The scale is monodimensional. Higher scores indicate higher levels of perceived stress. The scale showed high levels of internal consistency with Cronbach’s alpha of .82.

Academic performance was assessed by calculating the grade point average (GDA) for the first year.

6. Findings

Correlation and regression analyses were performed using SPSS 20.0 for Windows to reach the aims of the present research.

Descriptive statistics (mean and standard deviations) of the variables taken account are reported in Table 1. Before run causal analyses, t-test statistics were calculated in order to assess gender effects on the scales scores. Results showed statistically significant differences between men and women in the GDA, $t(403.173) = -3.057$, $p < .01$, and perceived stress, $t(490) = -5.59$, $p < .001$. More specifically, females obtained higher scores than males in both variables. However, these results could be biased by the higher percentage of women in the sample

Table 01. Means (M) and standard deviations (SD) of LAS, PSS, and Exam scores across the total sample and gender groups

	Mean (SD)		
	Total sample	Males	Females
GDA	60.84 (15.96)	58.22 (17.15)	62.73 (14.78)
Locomotion	45.08 (4.23)	44.79 (4.41)	45.29 (4.08)
Assessment	37.91 (5.30)	37.54 (5.60)	38.18 (5.07)
Perceived stress	27.30 (5.98)	25.58 (5.58)	28.55 (5.96)

Correlational analyses were run to analyze the association between the variables of interest. Results revealed that the GDA was positively related to locomotion ($r = .17$, $p < .001$) and assessment ($r = .10$, $p < .05$), and assessment was positively associated to perceived stress ($r = .24$, $p < .001$). A negative association emerged between locomotion and perceived stress ($r = -.24$, $p < .001$). The GDA showed no significant correlation with perceived stress ($r = -.07$, $p > .05$).

Further analyses using stepwise linear regressions (forward techniques) showed that only locomotion had a significant effect on GDA ($\beta = .61$, $p < .001$) after removing perceived stress and assessment. Hence, as expected, the main predictor of academic performance seems to be locomotion. However, the unexpected absence of causal relationship between assessment, perceived stress, and academic performance should be further analyzed.

As perceived stress was significantly associated with locomotion and assessment, a regression analysis was further performed considering self-regulations modes as predictors and perceived stress as the outcome in order to better understand the nature of this relationship. As expected, perceived stress was predicted positively by assessment ($\beta = .26$, $p < .001$) and negatively by locomotion ($\beta = -.26$, $p < .001$).

7. Conclusion

The purpose of the current research was to investigate the impact of self-regulated orientations and perceived stress on academic performance. Consistently with the hypothesized predictions, findings suggested that self-regulatory modes, i.e., locomotion and assessment, were associated to perceived stress and GDA, even though the correlation coefficients were rather low. However, the relationship between locomotion and task performance was stronger than the relationship between assessment and task performance. Surprisingly, perceived stress showed no association with GDA. Regression analyses revealed that students' academic performance was positively predicted only by locomotion, partially confirming past research which highlighted the role of the self-regulatory modes in successful task performance (Kruglanski et al., 2013; Lo Destro et al., 2015). In other words, the way students performed academically seemed to depend by the self-regulatory aspect related to the movement and the engagement of psychological resources in initiating and maintaining an activity. According to some research, individuals high in locomotion exhibit a greater ability to focus on a task without getting distracted (Pierro et al., 2011), manage better their time (Amato, Pierro, Chirumbolo, & Pica, 2014), tend to complete a task quickly (Kruglanski et al., 2000; Mauro et al., 2009), and take less time to finish proofreading tasks (Kruglanski et al., 2000). The higher academic performance in this study could be influenced by those individual differences in the self-regulatory strategy of locomotion.

Of particular interest, self-regulatory orientations significantly predicted perceived stress. That is, the degree to which participants perceived life situations as stressful was determined by the way they regulated their goal-related activities. Specifically, those who were high on assessment, tend to perceive life events as unpredictable, uncontrollable, and overloaded, whereas high locomotors were more able to handle these situations.

In sum, the present research provided initial efforts to analyze the relationship between self-regulation processes and perceived stress. However, some limitations should be noted. First, as a self-report measure, the questionnaire could be influenced by biases. Second, as this investigation dealt only with a specific indicator of the academic performance, i.e., GDA, future research should replicate and extend the study including further related constructs. Please replace this text with context of your paper.

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