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Work-related stress among nurses: the effect of regulatory mode

Stress lavoro-correlato tra le infermiere: gli effetti dei modi regolatori

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ABSTRACT

Regulatory mode theory (Kruglanski et al., 2000) assumes the existence of two regulatory modes orientation: (1) *assessment* reflecting the propensity to evaluate goals and means and to find the best option; (2) *locomotion* concerning the tendency to move from a state to another.
A relevant number of studies has examined the relationship between regulatory mode and organizational well-being. However, none of them allows any certain causal direction inference. Therefore, the aim of the present paper is to investigate the causal relationship between regulatory mode and stress by means of a two-wave longitudinal design. In the first phase, we recruited 120 nurses from an Italian hospital and obtained their scores on the Regulatory Mode Scale and their ratings of work stress; in the second phase, we asked the same participants to respond only to the work stress measure. Two separate multiple regression analyses were run to test the main effect of regulatory mode predominance (given by the subtraction of assessment from locomotion scores) on the two stress measures. In line with our predictions, the results showed that regulatory mode predominance predicted work stress both in the first and in the second phase. Implications, limitations and future directions for these findings are discussed.
Keywords: regulatory mode; locomotion; assessment; stress; nurses.

RIASSUNTO

La teoria dei modi regolatori (Kruglanski et al., 2000) assume l'esistenza di due modi regolatori: (1) *assessment* che riflette la propensione a valutare scopi e mezzi ed a cercare la migliore opzione; (2) *locomotion* che concerne la tendenza a muoversi da uno stato ad un altro.
Un rilevante numero di studi ha esaminato la relazione tra modi regolatori e benessere organizzativo. Tuttavia, nessuno di essi permette alcuna inferenza certa sulla direzione causale. Di conseguenza, lo scopo del presente articolo è di investigare la relazione causale tra modi regolatori e stress attraverso l'uso di un disegno longitudinale a due fasi. Nella prima fase, abbiamo reclutato 120 infermieri da un ospedale italiano ed ottenuto i loro punteggi alla scala dei Modi Regolatori e le loro valutazioni dello stress lavorativo; nella seconda fase, abbiamo chiesto agli stessi partecipanti di rispondere solo alla misura di stress lavorativo. Sono state condotte due analisi di regressione multiple per testare l'effetto principale della predominanza dei modi regolatori (ottenuta dalla sottrazione dei punteggi di assessment da quelli di locomotion) sulle due misure di stress. In linea con le nostre previsioni, i risultati hanno mostrato che la predominanza dei modi regolatori prediceva lo stress lavorativo sia nella prima che nella seconda fase. Implicazioni, limitazioni e future direzioni di questi risultati vengono discusse.
Parole chiave: modi regolatori; locomotion; assessment; stress; infermieri.

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Introduction

In the field of organizational psychology, stress has been defined as "the subjective feeling that work demands exceed the individual's belief in his or her capacity to cope" (Cropanzano, Howes, Grandey, & Toth, 1997, p. 164). Past research has demonstrated that health professionals are a group of workers at significant risk to experience negative feelings in response to stressful workplace conditions (Kirkcaldy & Martin, 2000; Tyler & Cushway, 1998). Nurses are particularly at risk and the stressors they are daily exposed may have detrimental effects on both their mental and physical health, absenteeism, staff conflict and turnover, productivity and efficacy at work, as well as on patients' outcomes such as increased patient dissatisfaction and mortality (Vahey et al., 2004; Foxall, Zimmerman, Standly, & Captain, 1990; Larson, 1987; Price & Murphy, 1984).

Considering the role stress can play on both employees' and organizations' health, it seems of crucial importance to identify its predictors. Past research (Fogarty et al., 1999; Girardi, Falco, Dal Corso, Kravina, & De Carlo, 2011) has shown that individual differences can play a fundamental role in individuals' likelihood of experiencing organizational stress. In this vein, the Regulatory Mode theory (Kruglanski et al., 2000) has identified two important individual differences: (1) assessment "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); (2) locomotion " the self-regulatory aspect concerned with movement from state to state and with committing the psychological resources that will initiate and maintain goal-directed progress in a straightforward manner, without undue distractions or delays" (Kruglanski et al., 2000, p. 794). In line with these notions, assessment is associated with the preference for a thoughtful and methodical analysis of the available options, whereas locomotion is related to swift action and a desire to maintain uninterrupted movement. In the assessment mode, individuals are worried with evaluations related to standards and reference points (see Higgins, Kruglanski, & Pierro, 2003). In the locomotion mode, they emphasize "doing" and "getting on with it" (see Higgins et al., 2003) over critical evaluation. Assessment and locomotion can be measured as chronic individual differences (Kruglanski et al., 2000) or induced as state variables (Avnet & Higgins, 2003).

Assessment has generally been associated with negative affect and depression (Kruglanski et al., 2000; Hong, Tan, & Chan, et al., 2004). Such relationship finds a substratum in high assessors' propensity to incessantly make in action critical judgment of their own and others' decision, which is not beneficial for their psychological health. Yet another distinctive characteristic of assessors is the tendency to dwell on the gap between the current and the ideal self, which is also related to a significant increase of negative affect (Higgins, 1987). On the other hand, locomotors have generally shown positive affect, optimism and higher self-esteem (Kruglanski et al., 2000; Kruglanski, Pierro, & Higgins, 2016). The association between locomotion and positive affect finds an explanation in locomotors' focus on progress and motion, which leads them to avoid ruminating on negative aspects of their past or current states.

In everyday life situations, as well as in the work environment, people frequently have to decide whether to behave as an assessor or as a locomotor. In fact, individuals can diverge in the strength of both their assessment and locomotion motivations and the way they behave will ultimately be influenced by the relative force of these orientations. For these reasons, in the present work the focus will be on nurses' predominance on one motivational mode over the other. In support to these notions, a recent study (Lo Destro, Chernokova, Aiello & Pierro, 2017) found that assessment positively predicted both stress and turnover intentions, whereas locomotion negatively predicted those variables. More importantly, using a mediated moderation analysis, it was showed that employees *high* on assessment but *low* on locomotion expressed more turnover intentions and this relationship was mediated by stress at work. Many other studies in the field of organizational well-being have analyzed the link between regulatory mode and negative (*vs.* positive) affect. One research (Pierro, Giacomantonio, Pica, Kruglanski, & Higgins, 2013, Study 2) found that locomotion predicted job satisfaction and it was associated with lower stress and turnover intentions. Another research (Bélanger et al., 2016) showed that locomotion predicted withdrawal behaviors and, in fact, it was negatively associated with absenteeism, lateness, and early departures from work. Yet another work (De Carlo et al., 2014) investigated the role of assessment and found it was positively related to psychological strain and burnout; on the contrary, locomotion was negatively related to both outcomes. Moreover, both

locomotion and assessment positively predicted workaholism, which in turn positively predicted both burnout and psychological strain; additionally, locomotion positively, whereas assessment negatively, predicted work engagement, which in turn negatively predicted burnout and psychological strain. Another work (Bélanger et al., 2014) found that locomotion had a negative direct effect on stress, whereas assessment had a positive direct effect on it. Furthermore, locomotion positively predicted harmonious passion, which in turn negatively predicted both stress and burnout; on the other hand, assessment positively predicted obsessive passion, which in turn positively predicted both stress and burnout.

Thus, multiple works have corroborated the idea that assessment is associated with a lower organizational well-being, whereas locomotion is related to a more positive organizational adjustment. However, the findings presented till this point could be addressed by alternative explanations (e.g., stronger stress could strengthen an assessment orientation and weaken a locomotion orientation) and they do not allow any clear causal direction inference. In order to address this issue, the present work aim is to examine the causal direction between stress and regulatory mode by using a longitudinal research design, with the second phase taking place two months after the first. Specifically, we hypothesize that regulatory mode predominance, measured in the first phase, should predict both stress measured in the first and in the second phase of the study.

Method

Participants. One hundred and twenty nurses (68 males) from an Italian hospital participated in this research on a voluntary basis. Employees' mean age was 46.60 (*SD* = 10.34) and their mean job tenure was 20.10 years (*SD* = 11.31). In the first phase of the research, participants filled out a short version of the Regulatory Mode Scale (Kruglanski et al., 2000), which was followed by a measure of stress at work (Cohen, Kamarck, & Mermelstein, 1983). In a second phase, after two months, participants were asked to complete the same measure of stress.

Measures

Regulatory mode orientations. Participants completed a short version of the Italian Regulatory Mode Scale (Kruglanski et al., 2000) composed by two separate 9-items self-report measures designed to tap individual differences in locomotion and assessment. Specifically, nurses rated the extent to which they agreed with self-descriptive statements reflecting *locomotion* (e.g., "I enjoy actively doing things, more than just watching and observing") or *assessment* (e.g., "I often compare myself with other people"). Ratings were made on a 6-point Likert scale ranging from 1 (*Strongly disagree*) to 6 (*Strongly agree*). Previous works with Italian samples (Kruglanski et al., 2000) showed that locomotion and assessment scales have a satisfactory reliability (Cronbach's *a* .82 for the locomotion scale and .78 for the assessment scale). In the present sample, the alpha for locomotion and assessment scales was respectively .70 and .80. In line with previous studies (cf. Higgins, Kruglanski, & Pierro, 2008; Orehek, Mauro, Kruglanski & Van der Bles, 2012), participants' predominant regulatory mode was calculated by subtracting assessment scores from locomotion scores. Thus, positive scores on this variable denote a greater predominance of locomotion, whereas negative scores reflect a greater assessment predominance.

Stress. Participants responded to the Perceived Stress Scale (Cohen, et al., 1983). Specifically, six items of the scale were adapted to measure participants' stress at work (e.g., "In the last month, I often felt unable to control important things at work"; "In the last month, I often felt nervous and stressed at work"; see Lo Destro et al., 2017). Participants responded on a 6-point Likert scale ranging from 1 (S*trongly disagree*) to 6 (S*trongly agree*). As mentioned, nurses had to complete this scale two times. Alpha was .91 for the first measure and .88 for the second.

Results

Attrition Check. In the present work, the dropout rate between the two research phases was 30%, some information about possible attrition or mortality-rate effects on our dependent measure need to be reported. Following the recommendation of Goodman and Blum (1996), we assessed the possible presence of a nonrandom sampling bias using multiple logistic regression analysis. This analysis is recommended because it models the probability of being included in one of two response

categories (e.g., remaining in or leaving a sample) and because it takes into account the relationship among the variables (Goodman & Blum, 1996). In this analysis, we used a dichotomous variable, distinguishing participants who remained in the second research phase from those who dropped out, as the dependent variables and all of the variables of interest to the research measured at the first phase (i.e., stress, locomotion, assessment, job tenure, gender, age) as the independent variables. Results of this analysis did not show any significant effect of our independent variables (stress, $B = .28$, $p = .134$; locomotion, $B = -.06$, $p = .875$; assessment, $B = .20$, $p = .407$; job tenure, $B = -.01$, $p = .862$; gender, $B = .32$, $p = .461$; age, $B = .03$, $p = .486$), counterindicating the presence of nonrandom sampling (i.e., indicating that the data are missing at random). Thus, as suggested by Goodman and Blum (1996), we can be reasonably confident that attrition will not bias subsequent longitudinal data analyses of our variables.

Descriptive statistics and correlations between variables are presented in Table 1. As can be seen, consistently with prior research (e.g., Kruglanski et al., 2000), in this sample, the correlation between assessment and locomotion scales was non-significant. As expected, stress measured in the first phase was significantly and negatively correlated with locomotion and significantly and positively correlated with assessment. Furthermore, regulatory mode predominance measure was significantly and negatively correlated with both measures of stress, which were highly correlated one each other.

The correlation between stress measured in the second phase and regulatory mode followed the same pattern of the stress measure collected in the first phase. However, these correlations were not significant and such lack of significance was probably due to the lower number of participants who filled out the scale in the second phase.

Table 1. Bivariate Correlations and Descriptive Statistics

Variables	1	2	3	4	5	*M(SD)*
1. Locomotion	(.70)					5.17 (.51)
2. Assessment	.047	(.80)				3.07 (.97)
3. LocAss	.431***	-.881***	-			2.10 (1.08)
4. Stress time 1	-.186*	.386***	-.437***	(.91)		2.89 (1.33)
5. Stress time 2	-.148	.188	-.255*	.701***	(.88)	2.94 (1.16)

Note: *$p < .05$, **$p < .01$, ***$p < .001$. In parenthesis (Cronbach's Alpha). *N time 1* = 120; *N time 2* = 84.

Predictions regarding the main effects of regulatory mode predominance on stress were tested by means of two separate multiple regression analyses. In the first multiple regression analysis, the main effects of regulatory mode predominance, gender (dummy coded as Male = 0 and Female = 1), age and job tenure were entered. The dependent variable was stress measured in the first phase of the study. In the second multiple regression analysis were entered the same predictors, whereas the dependent variable was stress measured in the second phase of the study. As can be seen in Table 2, the results of the first multiple regression analyses yield a significant and negative main effect of regulatory mode predominance on stress measured in the first phase ($\beta = -.45$, $SE = .10$, $p < .001$) demonstrating that individuals who have a higher locomotion (over assessment) predominance are less incline to experience stress. The similarity of the results obtained when the dependent variable was stress recorded in the second phase of the research ($\beta = -.26$, $SE = .12$, $p = .016$) confirmed and strengthened the findings obtained. None of the two regression analyses showed other significant main effects.

Table 2. Summary of Multiple Regression Analyses

	Stress 1			Stress 2		
	beta	SE	P	beta	SE	P
RM Predominance	-.45	.10	.000	-.26	.12	.016
Gender	.02	.22	.766	.03	.24	.806
Age	.13	.02	.411	-.05	.02	.798
Job Seniority	.15	.02	.353	.36	.02	.093

Note: The dependent variables were stress measured in the first phase (Stress 1) and stress measured in the second phase (Stress 2). *N time 1* = 120; *N time 2* = 84.

Discussion and Conclusion

The present work aimed at investigating the causal direction between regulatory mode and stress at work. In this vein, we recruited a sample of nurses, which are a category particularly at risk for the type of job they do and the work environment they have to face in their everyday life. The results of the study revealed that regulatory mode predominance, obtained by subtracting assessment from locomotion scores, negatively predicted stress and such results were very similar for both the first and the second phase. These findings demonstrate that nurses, whose assessment mode is predominant over locomotion, experience increased stress at work and this association seems to remain stable over the time. On the other hand, nurses, whose locomotion mode is predominant over assessment, are less at risk to exhibit work-related stress. These findings are in line with the ones obtained in previous works on the topic (e.g., Lo Destro et al., 2017), which have found that the combination of high assessment and low locomotion was the best predictor of work stress. Thus, this work confirmed assessment predominance is highly related with negative affective states. Furthermore, the present research, due to its longitudinal nature of the design, furnishes additional support to the strength of the association between regulatory mode and work stress.

Such results can be explained by high assessors' excessive focus on discrepancies, which combined with low locomotors' lack of progress toward handling those discrepancies exacerbates negative affect. On the opposite side, high locomotion focus on progress refrains from ruminating on negative events and, thus, plays a protective role against threatening stimuli (Kruglanski et al., 2000; Kruglanski et al., 2016).

As mentioned, nurses are part of a category particularly at risk because they can be often exposed to a large number of threatening stressors, including high workload, conflict with physicians, discrimination and dealing with death, patients, and their families (French, Lenton, Walters, & Eyles, 2000). Such work conditions may have harmful consequences on individuals' physical, mental and emotional well-being. In fact, stress has been associated with increased musculoskeletal disorders, cardiovascular and respiratory diseases, occupational cancers, psychological distress such as lack of concentration, sleep disturbance, insomnia, anxiety, intolerance, depression and even suicide (Kang et al., 2005; Melin & Lundberg, 1997; Punch & Tuettemann, 1991; Richings, Khara, & McDowell, 1986). Additionally, on the organizational level, increased job stress levels have been related to lower productivity, decreased concentration, attention and decision making skills (Reynolds, 1997; Shapiro, Astin, Bishop, & Cordova, 2005). Work stress has also been negatively related to the quality of care, due to loss of empathy and compassion for patients and increased numbers of mistakes (Leveck, & Jones, 1996; Macpherson, Eastley, Richards, & Mian, 1994). Furthermore, as work stress increases, employees are more likely to form turnover intentions, deciding to leave the organization they are working for (Fisher & Gitelson, 1983; Griffeth, Hom, & Gaertner, 2000).

In the light of the results obtained in the present work, it can be affirmed that nurses (and more generally employees) who display this self-regulation pattern (i.e., assessment predominance over locomotion) are at higher risk to experience job stress and to develop the symptoms we have just described. In line with these conclusions, managers (especially in health-related environment) should carefully consider employees' regulatory modes during the recruitment process, since it seems employees showing a locomotion predominance have a lower predisposition to express job stress.

From a prevention point of view, managers should take into account employees' differences and, consequently, adapt tasks' requests and responsibilities. Hospitals, and organizations in general, should take care of nurses' (and employees') well-being, especially of those who may be at higher risk to experience stress during their daily activities. In this vein, past research has described different practices useful in the reduction of emotional exhaustion and stress, such as general work hour limitations (Goitein, Shanafelt, Wipf, Slatore, & Back, 2005; Hutter, Kellogg, Ferguson, Abbott, & Warshaw, 2006), ad hoc counseling intervention programs (Rø, Gude, Tyssen, & Aasland, 2008) and the presence of support networks in the nursing environment (Bartram, Joiner, & Stanton, 2004; Farrell, Bobrowski & Bobrowski, 2006).

In conclusion, the present work takes the knowledge on the relationship between regulatory mode and stress one step further using a longitudinal research design and confirming the strength of the association between assessment predominance and work stress. Nonetheless, several limitations of the present research should be noted. The first one is the adoption of a self-report measure of stress. Future studies should address this issue, measuring, for instance, some physiological indexes of stress, as salivary cortisol levels (Pruessner, Hellhammer, Pruessner, & Lupien, 2003). Another limitation is related to the fact that these data are derived from the same source, and thus could potentially be susceptible to common method/source bias.

Given the lack of information about nurses' performance, future research would do well to examine the relationship between regulatory mode, performance and organizational well-being. Furthermore, this work may serve as a foundation for future researches in different population of employees at risk (e.g., law enforcement, teachers). Finally, more studies including employees from different hospitals and various countries would enrich the literature on the topic.

Author Contributions

AP: designed and executed the study and analyzed the data. CLD and DDS: collaborated with the design and writing of the study. CLD and DDS collaborated with the recruitment of participants and with data scoring. AP, CLD and DDS collaborated in the writing and editing of the final manuscript.

Compliance with Ethical Standards

Conflict of interest

The authors declare that they have no competing interests.

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Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

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