

HOW REGULATORY MODES WORK TOGETHER: LOCOMOTION-ASSESSMENT COMPLEMENTARITY IN WORK PERFORMANCE

ANTONIO PIERRO

GENNARO PICA

ROMINA MAURO

“SAPIENZA” – UNIVERSITY OF ROMA

ARIE W. KRUGLANSKI

UNIVERSITY OF MARYLAND, COLLEGE PARK

E. TORY HIGGINS

COLUMBIA UNIVERSITY

This research investigated the interactive effects of employees' locomotion and assessment regulatory modes (Higgins, Kruglanski, & Pierro, 2003; Kruglanski et al., 2000) on their work performance in organizational contexts. Three field surveys were conducted in different work organizations, using different research designs (cross-sectional and longitudinal) and different work performance measures (self-report and managers' ratings). As predicted, the studies found positive interactive effects of the two regulatory mode orientations on work performance.

Key words: Regulatory mode; Locomotion; Assessment; Work performance.

Correspondence concerning this article should be addressed to Antonio Pierro, Dipartimento di Psicologia dei Processi di Sviluppo e Socializzazione, “Sapienza” – Università di Roma, Via dei Marsi 78, 00185 ROMA, Italy. E-mail: antonio.pierro@uniroma1.it

INTRODUCTION

All work organizations engage to some degree in finding solutions to organizational problems relating to productive or counterproductive employee behaviors. Productive behavior is defined as employee “behavior that contributes positively to the goals and objectives of the organization,” and counterproductive behavior as “behavior that explicitly runs counter to the goals of an organization” (Britt & Jex, 2008, p. 168). Job performance represents behaviors employees engage in during work which are related to organizational goals (Britt & Jex, 2008).

Occupational productivity constitutes a topic of great interest to organizational researchers and practitioners (Austin & Villanova, 1992; Wallace & Chen, 2006). Productive behaviors, as well as counterproductive behaviors, have their determinants in both situational factors (e.g., organizational climate, leadership styles) and personal characteristics (e.g., personality traits, self-regulatory mechanisms) (Barrick & Mount, 1991; Wallace & Chen, 2006). In particular, in order to further the science of personnel selection and recruitment, scholars have called for the

development of models of work behavior that posit linkages among individual difference constructs and components of work performance (Campbell, 1990; Schmidt & Hunter, 1992; Viswesvaran & Ones, 2000). Responsive to this call, the present research aimed to verify how work performance is affected by individual differences in the tendency toward *locomotion* and *assessment*, two self-regulatory concerns outlined by the regulatory mode theory (Higgins, Kruglanski, & Pierro, 2003; Kruglanski et al., 2000). In what follows, we introduced the regulatory mode theory and discussed its implications for work performance.

Regulatory Mode Theory: Locomotion and Assessment as Independent Functions

In self-regulating toward their goals, people generally focus on two types of activities. They (1) critically evaluate what they actually wish to do and how best their goals can be achieved; (2) they actually go ahead, that is, invest efforts in realizing their intentions and channeling them into concrete undertakings.

Psychologists have paid considerable attention to the determinants and consequences of self-regulation, especially to the control aspects of attaining goals or meeting standards (see Carver & Scheier, 1990; Gollwitzer, 1990; Higgins, 1989; Kuhl, 1985, 1986; Mischel, 1974, 1981). According to the classic theory of control (see Carver & Scheier, 1990; Kuhl, 1985), the purpose of self-regulation is to *move* a current state in the direction of a desired end-state, in order to minimize any discrepancy between them. As a means of doing so, the current state is *compared* to the desired end-state to assess whether any discrepancy between them remains (e.g., Miller, Galanter, & Pribram, 1960; see also Carver & Scheier, 1990; Kuhl, 1985). Thus, in classic terms, self-regulation involves an assessment comparative function that provides feedback for carrying out the locomotion movement function.

Kruglanski, Higgins, and Pierro (Higgins et al., 2003; Kruglanski et al., 2000) introduced a regulatory mode theory of self-regulation that considers the locomotion and assessment functions to be both more general and more independent than described in classic control theories. Although locomotion and assessment may be thought as interdependent components of the larger self-regulatory system, each may receive differential emphasis by different people and in different situations. As a consequence, some situations may induce individuals to pay particular attention to, and invest particular resources in, locomotion whereas other situations may do so in regard to assessment. Moreover, some individuals may stably emphasize locomotion whereas others may emphasize assessment. According to regulatory mode theory, chronic individual differences in emphasizing either locomotion or assessment are a product of both socialization processes and temperament. From an individual difference perspective, the independence of the two regulatory modes would be reflected in the fact that not only are there individuals who are high in locomotion and low in assessment and individuals who are high in assessment and low in locomotion, but there are also individuals who are relatively high or relatively low in both dimensions.

In accordance with this conceptualization, Kruglanski et al. (2000) developed and validated two scales (12 items each) that measure the orientation toward locomotion and toward assessment. Results obtained in several sub-samples, both in the United States and in Italy, showed the internal consistency and temporal stability of the two scales. Validation studies showed that the two constructs are independent, and have good convergent and divergent validity, as well as strong predic-

tive validity. As mentioned earlier, stable individual differences in locomotion and assessment are especially important for work performance. Before presenting our specific hypotheses in this regard, we will discuss the locomotion and assessment functions in greater detail.

Locomotion Orientation

The locomotion orientation is defined as a propensity toward action. According to Kruglanski et al. (2000), it is “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 in a straightforward and direct manner, without undue distractions or delays” (p. 794). More generally, according to field theory (Lewin, 1951), locomotion concerns any change of position occurring in any region within the life space. In this definition, the essential motivation of people high on the locomotion dimension is simply to “move” in an experiential or psychological sense. In a sense, the goal of the activity (i.e., the positive or negative end-state) is considered to be the consequence rather than the cause of the locomotion motivation. According to regulatory mode theory, individuals with a high locomotion tendency treat goals as “excuses” to engage in psychological movement: it fosters a sense of “flow” (Csikszentmihalyi, 1975) wherein the individual with a high locomotion tendency is thoroughly absorbed in the activity and is committed in various goals. In the locomotion mode, individuals emphasize “doing” (doing anything just to stop doing nothing) “getting on with it,” “making something happen” (see Higgins et al., 2003) rather than critical evaluation. Indeed, individuals strong in locomotion mode might refrain from critical evaluation if such “stopping to reflect” halted steady movement from state to state.

Several studies (see Higgins, Pierro, & Kruglanski, 2008; Kruglanski et al., 2000; Pierro, Kruglanski, & Higgins, 2006a) have shown that the locomotion tendency is positively related to various measures of task orientation, achievement orientation, intrinsic motivation, self-esteem, and to the Big Five personality traits (cfr. Costa & McCrae, 1992) of extroversion and conscientiousness. This last personality trait turns out to be consistently associated with performance in several work settings (for a meta-analytic review, see Barrick & Mount, 1991). Furthermore, and especially germane to the present research, locomotion has been found to be positively related to job involvement and effort investment in work activities (Pierro, Kruglanski, & Higgins, 2006b), which are motivational factors consistently associated with work performance (Blau, 1993; Brown & Leight, 1996, Pierro et al., 2006b). Even more relevant for the present research is the fact that locomotion has been found to be positively related to college students’ grade point averages (GPA; controlling for Scholastic Aptitude Test scores; Kruglanski et al., 2000, Study 7) and successful completion of elite military training (Kruglanski et al., 2000, Study 8).

Assessment Orientation

Assessment 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). The assessment function, therefore, generally refers to a determination of the rate, amount, size, value, or importance of something. Thus, the value or importance of both the current state and the end state can be independently as-

sessed, and so can the value or utility of the means used to move toward or away from that end state. “What are my options?” “Are there any other possibilities worth considering?” “Which alternative is the best?” “What should I do in the future?” “How did I do in the past?” Individuals strong in assessment mode are preoccupied with these kinds of critical evaluations (see Higgins et al., 2003), and can be described, generally, as “critical” and “perfectionist.”

Several studies (Kruglanski et al., 2000; Pierro et al., 2006a) have shown that the assessment orientation is positively related to fear of invalidity, discomfort with ambiguity, need for social comparison, and fear of failure. Because of their pervasive concern with appraisal and evaluation, individuals high (vs. low) in assessment concerns are more extrinsically motivated toward tasks. They are less likely to be “immersed” in the activity per se, in light of their perennial preoccupation with calculating discrepancies, comparing alternatives, etc..

Locomotion and Assessment Working Together

Both high assessors and high locomotors possess certain strengths, as well as particular weaknesses, in the self-regulatory aspects of goal pursuit. For instance, high locomotors and high assessors exemplify a trade-off between speed and accuracy in goal-relevant tasks, where locomotors are more concerned with speed and assessors more concerned with accuracy (Kruglanski et al., 2000). Similarly, although high locomotors are particularly decisive, task-oriented, and prone to faster-paced goal pursuit activities, high assessors are skilled at prioritizing among multiple goals, generating a variety of means that could be used in goal pursuit, and carefully evaluating the various goal pursuit paths before choosing one on which to embark (Higgins et al., 2003).

Research has generally supported the notion that locomotion and assessment are largely orthogonal regulatory modes (Higgins et al., 2003; Kruglanski et al., 2000). The independence of the two modes allows for a possible predominance of one mode over the other. Generally, assessment should lead to greater consideration of possible routes to goal pursuit, guiding the self in specified directions. However, a person operating predominately in the assessment mode may engage in excessive musing, always looking but never leaping. Generally, locomotion should improve the performance of many tasks through its emphasis on doing something, increasing attainment. However, a person operating predominately in the locomotion mode may engage in many activities without any particular end in mind, essentially “running around like a chicken with its head cut off” or “leaping” without first “looking.” Optimal self-regulation should usually utilize both modes of the self-regulation in order to constrain each other’s downsides, in order to “go” (locomotion) “in the right direction” (assessment) rather than going just anywhere (insufficient assessment) or reflecting forever and going nowhere (insufficient locomotion). “Going in the right direction” requires that locomotion and assessment *work together* (Higgins, 2012).

Blind locomotion can result in various mistakes, potentially avoidable if a modicum of assessment was in place. Similarly, the assessment of the best goal and the most appropriate means of attaining it is not beneficial unless the individual ultimately engages in locomotion toward the goal. Given the distinctive strengths and weaknesses of each regulatory mode alone, both locomotion and assessment are necessary for optimally effective goal pursuit. This idea is known as the *complementarity hypothesis* (Kruglanski, Pierro, Mannetti, & Higgins, in press).

A small but growing body of research supports the complementarity hypothesis and demonstrates the critical roles of both locomotion and assessment for self-regulation and similar goal-relevant activities. First, Kruglanski et al. (2000) showed that individuals who are high on both regulatory modes tend to perform better in goal pursuit and achievement. One study found that a main effect of locomotion on college GPA was qualified by an interaction with assessment (Study 7). The effect of locomotion was observed only among those high in assessment; this effect disappeared for those low in assessment. The same pattern held for individuals in rigorous and challenging Army Ranger training; locomotion scores predicted success rates only for those high in assessment (Study 8). A similar pattern of results was found in Pierro et al. (2006a, Study 4). These findings demonstrate that locomotion and assessment can act as complementary self-regulatory orientations within individuals, thus enhancing the goal-relevant performance of those who are high on both regulatory modes.

AIMS OF THE PRESENT RESEARCH

Consistent with regulatory mode theory, a first aim of the present research was to investigate, within different organizations in the Italian context, the relation between the two self-regulatory modes and work performance. In particular, we hypothesized a positive relation between locomotion concerns and work performance and, more importantly, a positive interaction effect of locomotion and assessment concerns on work performance, predicting better performance for people high in both dimensions. These hypotheses have been explored by three studies using different research designs (a cross-sectional design in Study 1 and longitudinal designs in Studies 2 and 3) and different work performance measures (self-report measures in Studies 1 and 2 and manager ratings in Study 3). A second purpose of the present research was to investigate the mediating role of *goal commitment* in the relation between locomotion concerns and work performance (Study 3).

STUDY 1

The aim of Study 1 was twofold: a) to test, in a different organizational and cultural context than the United States, the positive relationship between the locomotion mode orientation and work performance found in previous studies (e.g., Kruglanski et al., 2000); b) to test, consistent with the results obtained by Kruglanski et al. (2000), the positive interaction effect on work performance of the locomotion and assessment modes. In this study we used a cross-sectional design and self-report measures of work performance.

METHOD

Participants

One hundred and sixty-four promoters (37 females and 127 males; mean age = 35 years, $SD = 8.15$) of a financial society, from different Italian cities, participated in the study on a voluntary basis.

Procedure and Instruments

All participants filled out the *Locomotion* and *Assessment* scales (Kruglanski et al., 2000) followed by a number of filler questionnaires. They then completed two items designed to assess their level of work performance.

Locomotion and assessment orientations. The Italian versions of the *Locomotion* and *Assessment* Scales (Kruglanski et al., 2000) constitute two separate 12-item self-report measures designed to tap individual differences in these tendencies. Specifically, respondents rate the extent to which they agree with self-descriptive statements reflecting locomotion (e.g., “By the time I accomplish a task, I already have the next one in mind”) or assessment (e.g., “I spend a great deal of time taking inventory of my positive and negative characteristics”). Ratings are made on a six-point Likert-type scale with the response alternatives anchored at the ends with 1 (*strongly disagree*) to 6 (*strongly agree*). We computed two composite scores (one for locomotion and one for assessment) by averaging responses across to each item. Cronbach’s alpha for the locomotion scale was .79 and for the assessment scale was .70. Mean locomotion score was 4.89 ($SD = 0.70$) and mean assessment score 3.48 ($SD = 0.67$). In this sample, the two scales were not significantly correlated ($r = .04$, *ns*), consistent with previous studies attesting the independence of the two scales (Kruglanski et al., 2000).

Self-rated performance. Participants responded to two items: “In percentage terms, to what extent were your work objectives reached during the last year?” with responses on a 10-point scale ranging from 1 (10%) to 10 (100%); and, “How do you evaluate your performance in the last year?” with responses on a 10-point scale ranging from 1 (*extremely negative*) to 10 (*extremely positive*). A composite (mean) score was computed across these two items. Cronbach’s alpha for the performance measure was .86 and the mean score was 5.14 ($SD = 2.27$).

Results

Predictions regarding the effect on self-rated performance of the interaction between locomotion and assessment orientations were tested by means of a moderated multiple regression analysis (adopting the product variable approach suggested by Baron & Kenny, 1986). In this analysis, we entered the main effects of locomotion and assessment and the interaction between them. Following Aiken and West’s (1991) recommendation, regulatory mode orientations were centered, and the interaction term was based on the centered scores.

As expected, work performance was significantly and positively related to locomotion ($\beta = .22$, $p < .01$): participants high in locomotion had a higher level of self-reported work performance. On the other hand, work performance was not related to assessment ($\beta = -.05$, *ns*). More important for the present research, the interaction between the two regulatory mode orientations was positive and significant ($\beta = .16$, $p < .05$), suggesting that the positive relationship between locomotion and work performance was enhanced for individuals high (vs. low) in assessment orientation. These findings are illustrated via the predicted mean values showed in Figure 1. Following the suggestion by Aiken and West (1991), these were one standard deviation above and one standard deviation below the means of relevant variables.

To further illustrate the nature of this interaction, simple slopes analyses were performed,

following Aiken and West's (1991) suggestion. These analyses revealed that the relationship between locomotion and performance was strong and significant for participants high (1 *SD* above the mean) in assessment ($\beta = .39, p < .001$), but was not significant for participants low (1 *SD* below the mean) in assessment ($\beta = .05, ns$).

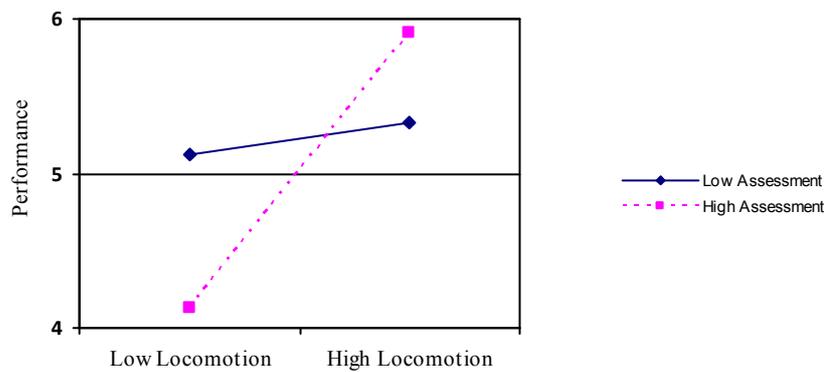


FIGURE 1
Performance as a function of locomotion and assessment orientations (Study 1).

Discussion

Consistent with previous studies (Kruglanski et al., 2000; Pierro et al., 2006a), findings of the present research confirm, in a different organizational and cultural context, both the main effect of locomotion orientation and, more importantly, the interactive effect between the two regulatory modes on work performance. Though these results are encouraging and compatible with previous findings and the theoretical framework underlying regulatory mode theory, Study 1 has some obvious limitations: the data come from a cross-sectional survey and self-report measures. Among other potential drawbacks, these data derive from the same source, and thus could be subject to common method/source biases. It should be noted, nonetheless, that while common method/source biases may inflate the relation between two variables, they typically result in an underestimation of interaction effects (Evans, 1985; McClelland & Judd, 1993). Thus, the interaction effect that is central to the present research cannot be readily attributed to methodological common source biases.

Since findings of this study could be addressed by alternative explanations (e.g., stronger past work performance could strengthen a locomotion orientation), they do not allow any clear causal direction inference. In order to address this point, Study 2 aims to examine the causal direction between variables by using a longitudinal research design.

STUDY 2

Study 2 aims to replicate, in a different organizational context and with a different research design, the results obtained in Study 1. As mentioned earlier, even though we used the

same method of data collection of Study 1 (i.e., self-report measures), in this study we adopted a two-wave longitudinal design, with the second phase taking place three months after the first.

METHOD

Participants

One hundred and twelve employees (40 females and 72 males; mean age = 36 years old, $SD = 9.80$) from a public company participated in the study on a voluntary basis.

Procedure and Instruments

In the first phase of the research all participants filled out the same locomotion and assessment scales used in Study 1, followed by a number of filler questionnaires. In the present sample, Cronbach's alpha for locomotion was .72 and the alpha for assessment was .69. Mean locomotion score was 4.58 ($SD = 0.53$) and mean assessment score was 3.21 ($SD = 0.69$). Consistent with previous studies confirming the independence between the two dimensions, in this sample the two scales were not significantly correlated ($r = .03, ns$).

In the second phase of the study, participants were asked to evaluate their work performance over the last three months using the same two items applied in Study 1. Cronbach's alpha for the two items in this sample was .61, and the mean score was 7.12 ($SD = 1.69$).

Results

As in Study 1, the hypothesized interaction between the two regulatory mode orientations on work performance was tested by means of a moderated multiple regression analysis in which we entered the main effects of locomotion and assessment and their interaction. As in Study 1, the interaction term was based on centered scores.

Again, results yielded a significant and positive main effect of locomotion ($\beta = .20, p < .05$), indicating better performance for employees higher in locomotion orientation. Again, in replication of Study 1 results, the main effect of assessment on performance was nonsignificant ($\beta = -.11, ns$).

Of special relevance is the finding that the hypothesized 2-way interaction between locomotion and assessment was positive and significant ($\beta = .30, p < .001$), indicating that work performance was enhanced for participants high on both locomotion and assessment orientations (see Figure 2). Subsequent simple slope analyses revealed that the relationship between locomotion and work performance was strong and significant for participants relatively high (1 SD above the mean) in assessment ($\beta = .46, p < .001$), but was nonsignificant for participants relatively low (1 SD below the mean) in assessment ($\beta = -.07, ns$).

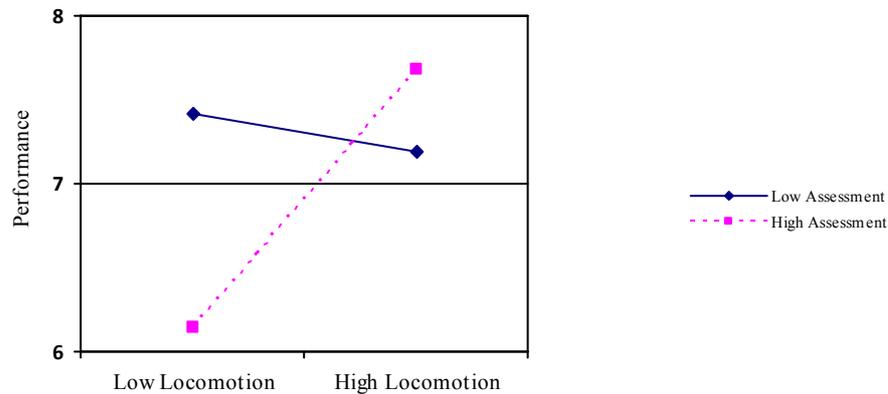


FIGURE 2
Performance as a function of locomotion and assessment orientations (Study 2).

Discussion

Consistent with findings of Study 1, results of Study 2 confirm, in a different organizational context and with a different research design, both the main effect of locomotion and the interaction effect between locomotion and assessment on work performance.

These Study 2 findings increase the support for our hypotheses because of the longitudinal nature of the design. However, as for Study 1, Study 2 findings have the limitation of being based on self-report measures. For this reason, we conducted Study 3, using a longitudinal design and the managers' ratings of followers' performance.

STUDY 3

The aims of Study 3 were: 1) to replicate the results of the previous two studies, in yet another organizational context, using a two-wave longitudinal design (three months apart) and managers' ratings of subordinates' work performance as the dependent variable; 2) to test the extent to which locomotion is associated with goal commitment, and the extent to which the main effect of locomotion on work performance is mediated by goal commitment, thereby supporting findings from earlier studies (Pierro et al., 2006a).

METHOD

Participants

Seventy-eight employees from an insurance company in Rome (41 females and 37 males; $M_{age} = 34$ years, $SD = 8.04$) participated in the study on a voluntary basis.

Procedure and Instruments

In the first phase of the study all participants filled out the same *Locomotion* and *Assessment* scales used in the previous two studies followed by a number of filler questionnaire. In the present sample Cronbach's alpha for the locomotion scale was .73 and alpha for the assessment scale was .70. Mean locomotion score was 4.60 ($SD = 0.52$) and mean assessment score was 3.23 ($SD = 0.73$). In this sample also the two scales were not significantly correlated ($r = .09, ns$), confirming the independence between the two dimensions. Then, participants responded, on a six-point scale (1 = *completely agree*; 6 = *completely disagree*), to the following three items designed to assess their work goal commitment: "I feel completely identified with the work goals"; "Even though it will require extra efforts, I'll do anything necessary in order to reach the established goals"; "Whatever happens, I will not give up in reaching the work goals." Cronbach's alpha for this measure was .71 and the mean was 4.22 ($SD = 0.92$).

In the second phase of the research, which occurred three months later, participants' supervisors were asked to evaluate the level of work performance of their followers in the last three months using the same two items used in Studies 1 and 2. In this sample, Cronbach's alpha for the performance measure was .86, and the mean score was 6.03 ($SD = 1.36$).

Results

A summary of correlations between variables is presented in Table 1. As can be seen, employees' work performance (rated, this time, by their supervisors) was positively and significantly related to locomotion orientation ($r = .29, p < .01$) and work goal commitment ($r = .33, p < .01$). In addition, locomotion was also positively and significantly related to goal commitment ($r = .55, p < .001$), supporting previous findings by Pierro et al. (2006a) regarding the greater job involvement and work efforts among locomotors. Assessment was not significantly correlated with either work performance ($r = .01, ns$) or goal commitment ($r = .04, ns$).

TABLE 1
 Correlations between variables (Study 3)

	1	2	3	4
1. Locomotion	–			
2. Assessment	.09	–		
3. Work performance	.29**	.01	–	
4. Goal commitment	.55***	.04	.33**	–

** $p < .01$. *** $p < .001$.

The hypothesized interaction effect between the two regulatory modes on work performance and the hypothesized mediating role of goal commitment in the relationship between locomotion and performance, were tested by means of hierarchical regression. In the first step of this analysis, we entered in the regression equation the main effects of the two regulatory modes

and their interaction. In the second step, we entered the previous effects plus the main effect of goal commitment. Results are summarized in Table 2: in the first step of this analysis the main effect of locomotion on work performance was positive and significant ($\beta = .26, p < .05$), confirming findings of Study 1 and Study 2. Again, like in Studies 1 and 2, the main effect of assessment on performance was nonsignificant ($\beta = -.03, ns$). Of greater interest is the finding that the hypothesized 2-way interaction between locomotion and assessment was significant and positive ($\beta = .21, p < .05$), indicating that work performance was enhanced for participants high on both locomotion and assessment orientations (see Figure 3). Subsequent simple slope analyses revealed that the relationship between locomotion and work performance was strong and significant for participants relatively high (1 *SD* above the mean) in assessment ($\beta = .45, p < .01$), but it was not significant for participants relatively low (1 *SD* below the mean) in assessment ($\beta = .07, ns$).

TABLE 2
 Work performance as a function of locomotion, assessment, and goal commitment:
 Results of hierarchical regression (Study 3)

	Beta
Step 1	
Locomotion	.26*
Assessment	-.03
Locomotion × Assessment	.21*
<i>R</i> ²	.13
Step 2	
Locomotion	.11
Assessment	-.03
Locomotion × Assessment	.23*
Goal commitment	.26*
<i>R</i> ²	.18

* $p < .05$.

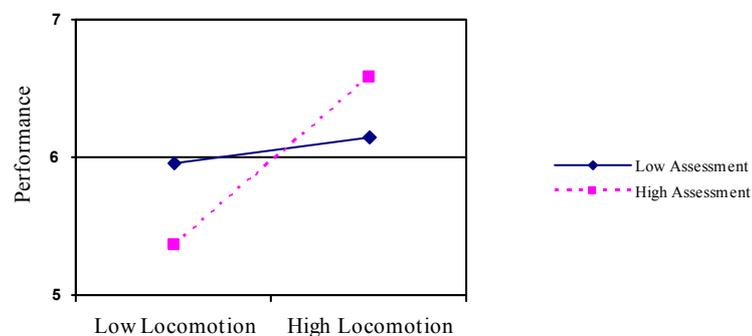


FIGURE 3
 Performance as a function of locomotion and assessment orientations (Study 3).

As can be seen in Table 2, in the second step where we entered in the equation the goal commitment scores ($\beta = .26, p < .05$), the main effect of locomotion on work performance notably decreased, if compared with the first step, and became nonsignificant ($\beta = .11, ns$). Sobel test (Preacher & Hayes, 2004a, 2004b) confirmed that the reduction in effect size attributable to goal commitment is marginally significant ($z = 1.94; p < .05$), consistent with our hypothesis that goal commitment mediates the relationship between locomotion and work performance. Notably, the interaction effect between locomotion and assessment on work performance was not mediated by goal commitment.

GENERAL DISCUSSION

Taken together, our set of studies demonstrates that locomotion and assessment orientations, as conceptualized by regulatory mode theory (Higgins et al., 2003; Kruglanski et al., 2000), have considerable relevance for predicting work performance in organizational contexts. Locomotion orientation refers to the tendency toward psychological movement. Performing tasks, in general, offers an opportunity for this movement which, in turn, needs energy investment. Thus, individuals characterized by high levels of locomotion orientation consider the tasks and objectives they are asked to perform to be attractive and worthy of engagement and, as a consequence, are willing to invest considerable efforts toward goal pursuit (goal commitment). Higher goal commitment also predicts better work performance (i.e., it mediates the relation between locomotion orientation and work performance).

In accordance with findings obtained by Kruglanski et al. (2000, Study 7 and Study 8) about the academic success of students and the successful fulfillment of military training programs, our results from three studies with different Italian organizational contexts also support the conclusion that individuals with higher locomotion concerns, who also have relatively high assessment concerns (i.e., locomotion and assessment working together), perform better at work. Importantly, these studies not only used different organizational contexts but also were conducted using different research designs (cross-sectional, Study 1; and longitudinal, Studies 2 and 3) and different measures of work performance (self-report, Studies 1 and 2, and supervisors' ratings, Study 3).

Assessment orientation refers, in general, to the tendency to make comparisons, evaluations about quantity and quality, to critically estimate the importance of things. Consistent with previous studies, the present research did not find a main effect of assessment on work performance. It is possible that measures of work performance may tend to emphasize the quantitative aspect of goal pursuit over a certain period of time, which might be more linked with the locomotion function. Future studies should also consider more qualitative aspects of work performance, such as those involving "intellectual" efforts, which could be more closely related to the assessment function. Nonetheless, the important role of assessment when working together with locomotion needs to be highlighted. In all three studies, the positive relation between higher locomotion and work performance only occurred when assessment was also relatively high. Locomotion needs the guidance and control of assessment to "go in the right direction" (see Higgins, 2012).

To examine further the effects of the interaction between locomotion and assessment on work performance, we first conducted a meta-analysis across all three studies using the META program developed by Kenny (2003), which involves (a) computing an effect size for each study, (b) pooling these effect sizes, and (c) testing them for homogeneity. As a basic measure of effect size in the meta-analysis, we used the beta coefficients. For the locomotion and assessment interactive effect, results of meta-analysis showed an average effect size of .22 ($SD = 0.07$), $t(2) = 5.51$, $p < .05$; Chi square (2, $N = 354$) = 1.43, $p = .49$. This result indicates that the interactive effect of locomotion and assessment on work performance was homogeneous and robust across the three present studies. Next, we conducted a second meta-analysis including the results of the three studies plus those of the studies described in Kruglanski et al. (2000, Study 7) and Pierro et al. (2006a, Study 4). Results for the locomotion and assessment interactive effect showed an average effect size of .17 ($SD = 0.05$), $t(4) = 8.42$, $p < .001$; Chi square (4, $N = 1079$) = 7.77, $p = .10$. These results confirm the homogeneity and robustness of the interactive effect of locomotion and assessment on work performance across different studies conducted in several different organizations and cultural contexts. It is fair to conclude that the two regulatory mode orientations operate in a synchronic and interdependent way during organizational goal pursuit (work performance).

Taking seriously calls in the literature to study the relation between individual differences and work performance (see Campbell, 1990; Schmidt & Hunter, 1992; Viswesvaran & Ones, 2000), we should also note that the present research has practical implications. Locomotion and assessment orientations are indeed motivational constructs that could be used for personnel selection; for example, candidates high in locomotion could be selected for job positions that require dynamism, commitment, physical effort, that fit the locomotion orientation, while job positions requiring critical evaluation, accuracy, perfectionism, quality, etcetera, that fit the assessment orientation, should be assigned to assessors. Likewise, individuals high in both orientations should be chosen for job positions requiring particular features that fit both regulatory mode.

Appreciating the distinct functions of the two regulatory mode orientations can be especially useful in composing working groups. The idea that is captured in the *complementarity hypothesis* (Kruglanski et al., in press), regarding how locomotion and assessment can work together effectively, has been found to be valid within individuals, across individuals within the same team, or across multiple levels of analysis (e.g., leaders and subordinates). While much of the research and theory on regulatory mode, including the present research, has considered the within-individual complementarities in locomotion and assessment strength, recent work has shown that complementarity can also occur between individuals (Kruglanski et al., in press). For instance, researchers have theorized that group-level complementarities in locomotion and assessment strength could impact various goal-relevant outcomes, including group-level performance. In one study, for instance, groups composed of either all assessors or all locomotors were at a disadvantage with regard to speed or accuracy, respectively (Mauro, Pierro, Mannetti, Higgins, & Kruglanski, 2009), whereas groups comprised of equal parts of locomotors and assessors performed just as quickly as groups with all locomotors and just as accurately as groups with all assessors.

Both the within-individual and within-group complementarity effects outlined above are characterized by one common feature: the independent and dependent variables operate within the same level of analysis. That is, within-individual complementarity impacts individual-level

performance, and within-group complementarity impacts group-level performance. What these studies did not address is whether cross-level complementarity effects occur, so that group-level complementarity in regulatory mode may impact individual-level performance. These cross-level effects should manifest as statistical interactions of group-level locomotion or assessment and individual-level assessment or locomotion, respectively.

Recently, results of a study by Pierro, Presaghi, Higgins, Klein, & Kruglanski (2012) supported the cross-level complementarity hypothesis for regulatory modes. In particular, results of this study provide clear support for the important role of team-level regulatory mode complementarity in individual-level performance ratings, specifically for individuals whose self-regulatory orientation was complemented by that of the other members of their team. Workers who possessed a complementary regulatory mode orientation (locomotion or assessment) from that of the other members of the team were the best individual performers: in teams in which other members were high on locomotion, individuals high on assessment were the best performers, whereas in teams in which other members were high on assessment, individuals high on locomotion were the best performers. These findings demonstrate intriguing multilevel complementarity effects on goal-relevant performance.

Findings of complementarity effects across different levels of analysis are important for several reasons. First, people are often rewarded for their work in a variety of settings at the individual, rather than team, level. The creation of an entire field dedicated to organizational justice (Greenberg, 1990) is, therefore, necessary. In the workplace, individuals receive bonuses, promotions, and other perks that reward them for their team's efforts, or for their individual contributions to the team. Cross-level complementarity effects for regulatory mode demonstrate that the motivational orientation of the group can impact important outcomes for individuals who comprise the group (Johns, 2006).

In addition, cross-level complementarity effects illustrate the advantages of having a specific type of deep-level diversity in teams (Harrison, Price, & Bell, 1998), namely, diversity of regulatory mode. Organizations may wish to screen individuals for regulatory mode in order to determine their fit to a pre-existing team (Tett & Burnett, 2003). These organizations would need to consider the current composition of the team in terms of regulatory mode and then assess which motivational strength(s) are still needed to maximize the efficacy of the team as a whole and of its individual members.

REFERENCES

- Aiken, L. S., & West, S. G., (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications.
- Austin, J. T., & Villanova, P. (1992). The criterion problem: 1917-1992. *Journal of Applied Psychology*, 77, 836-874. doi:10.1037/0021-9010.77.6.836
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182. doi:10.1037/0022-3514.51.6.1173
- Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44, 1-26. doi:10.1111/j.1744-6570.1991.tb00688.x
- Blau, G. J. (1993). Operationalizing direction and level of effort and testing their relationship to individual job performance. *Organizational Behavior and Human Decision Processes*, 55, 152-170.
- Britt, T. W., & Jex, S. M. (2008). *Organization psychology: A scientist-practitioner approach* (2nd ed.). New York, NY: John Wiley and Sons, Inc.
- Brown, S. P., & Leight, T. W. (1996). A new look at psychological climate and its relationship to job involvement, effort, and performance. *Journal of Applied Psychology*, 81, 358-368.

- Campbell, J. P. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette & L. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 2, pp. 687-732). Palo Alto, CA: Consulting Psychologists Press.
- Carver, C. S., & Scheier M. F. (1990). Origins and functions of positive and negative affect: A control process view. *Psychological Review*, *97*, 19-35. doi:10.1037/0033-295X.97.1.19
- Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco: Jossey-Bass.
- Evans, M. G. (1985). A Monte Carlo study of the effects of correlated method variance in moderated regression analysis. *Organizational Behavior and Human Decision Processes*, *36*, 305-323. doi:10.1016/0749-5978(85)90002-0
- Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins, E.T. & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 53-92). New York, NY: Guilford Press.
- Greenberg, J. (1990). Organizational justice: Yesterday, today, and tomorrow. *Journal of Management*, *16*, 399-432. doi:10.1177/014920639001600208
- Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface- and deep-level diversity on work group cohesion. *Academy of Management Journal*, *41*, 96-107. doi:10.2307/256901
- Higgins, E. T. (1989). Knowledge accessibility and activation: Subjectivity and suffering from unconscious sources. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 75-115). New York, NY: Guilford Press.
- Higgins, E. T. (2012). *Beyond pleasure and pain: How motivation works*. New York, NY: Oxford University Press.
- Higgins, E. T., Kruglanski, A. W., & Pierro, A. (2003). Regulatory mode: Locomotion and assessment as distinct orientations. *Advances in Experimental Social Psychology*, *35*, 294-344. doi.org/10.1016/S0065-2601(03)01005-0
- Higgins, E. T., Pierro, A., & Kruglanski, A. W. (2008). Re-thinking culture and personality: How self-regulatory universals create cross-cultural differences. In R. M. Sorrentino & S. Yamaguchi (Eds.), *Handbook of motivation and cognition across cultures* (pp. 161-190). New York, NY: Academic Press.
- Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review*, *31*, 386-408. doi:10.5465/AMR.2006.20208687
- Kenny, D. A. (2003). *Meta-analysis: Easy to answer* (Version III). Retrieved from <http://davidakenny.net/meta.htm>
- Kruglanski, A. W., Thompson, E. P., Higgins, E. T., Atash, M. N., Pierro, A., Shah, J. Y., Spiegel, S. (2000). To “do the right thing” or to “just do it”: Locomotion and assessment as distinct self-regulatory imperatives. *Journal of Personality and Social Psychology*, *79*, 793-815.
- Kruglanski, A. W., Pierro, A., Mannetti, L., & Higgins, E. T. (in press). The Unique Psychologies of “Looking” and “Leaping”: Assessment and Locomotion as the Springs of Action. *Social and Personality Psychology Compass*.
- Kuhl, J. (1985). Volitional mediation of cognition-behavior consistency: Self-regulatory processes and action versus state orientation. In J. Kuhl & J. Beckman (Eds.), *Action control: From cognition to behavior* (pp. 101-128). Berlin: Springer-Verlag.
- Kuhl, J. (1986). Motivation and information processing: A new look at decision making, dynamic change, and action control. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behaviour* (pp. 404-434). New York, NY: Guilford Press.
- Lewin, K. (1951). *Field theory in social science*. New York, NY: Harper.
- Mauro, R., Pierro, A., Mannetti, L., Higgins, E. T., & Kruglanski, A. W. (2009). The perfect mix: Regulatory complementarity and the speed-accuracy balance in group performance. *Psychological Science*, *20*, 681-685. doi: 10.1111/j.1467-9280.2009.02363.x
- McClelland, G. H., & Judd, C. M. (1993). Statistical difficulties of detecting interactions and moderator effects. *Psychological Bulletin*, *114*, 376-390. doi:10.1037/0033-2909.114.2.376
- Miller, G. A., Galanter, E., & Pribram, K. (1960). *Plans and the structure of behavior*. New York, NY: Holt, Rinehart and Winston.
- Mischel, W. (1974). Processes in delay of gratification. *Advances in Experimental Social Psychology*, *7*, 249-292.
- Mischel, W. (1981). Metacognition and the rules of delay. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures* (pp. 240-271). New York, NY: Cambridge University Press.
- Pierro, A., Kruglanski, A. W., & Higgins, E. T. (2006a). Regulatory mode and the joys of doing: Effects of “Locomotion” and “Assessment” on intrinsic task-motivation. *European Journal of Personality*, *20*, 355-375. doi:10.1002/per.600

-
- Pierro, A., Kruglanski, A. W., & Higgins, E. T. (2006b). Progress takes work: Effects of the locomotion dimension on job involvement, effort investment, and task performance in organizations. *Journal of Applied Social Psychology, 36*, 1723-1743. doi:10.1111/j.0021-9029.2006.00078.x
- Pierro, A., Presaghi, F., Higgins, E. T., Klein, K. M., & Kruglanski, A. W. (2012). Frogs and ponds: A multilevel analysis of the regulatory mode complementarity hypothesis. *Personality and Social Psychology Bulletin, 38*, 269-279. doi:10.1177/0146167211424418
- Preacher, K. J., & Hayes, A. F. (2004a). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717-731.
- Preacher, K. J., & Hayes, A. F. (2004b). *Sobel_spss.txt*. Retrieved October 19, 2005, from Psychonomic Society Web Archive: <http://www.psychonomic.org/ARCHIVE/>.
- Schmidt, F. L., & Hunter, J. (1992). Causal modeling of processes determining job performance. *Current Directions in Psychological Science, 1*, 89-92.
- Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology, 88*, 500-517. doi:10.1037/0021-9010.88.3.500
- Wallace, C., & Chen, G. (2006). A multilevel integration of personality, self-regulation, and performance. *Personnel Psychology, 59*, 529-557. doi:10.1111/j.1744-6570.2006.00046.x
- Viswesvaran, C., & Ones, D. S. (2000). Perspectives on models of job performance. *International Journal of Selection and Assessment, 8*, 216-226. doi:10.1111/1468-2389.00151