International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(RESEARCH ARTICLE)

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The Effort-Performance Gap in Motivational Communication: An Experimental Test of Linguistic Framing on Engagement and Task Accuracy

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International Journal of Science and Research Archive, 2025, 17(03), 797-801

Publication history: Received 11 November 2025; revised on 20 December 2025; accepted on 22 December 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.17.3.3246

Abstract

Background: While motivational communication is hailed as a key to performance, its direct effect on task accuracy remains unclear. This study investigates the differential effects of mastery-oriented and autonomy-supportive communication frames on employee engagement and task performance, testing for the presence of an "effort-performance gap."

Methods: In a between-subjects online experiment, 198 working professionals were randomly assigned to one of three conditions: mastery-oriented frame, autonomy-supportive frame, or neutral control frame. Participants completed a cognitive task (Remote Associates Problems) while we measured self-reported motivation, behavioral engagement (time-on-task, persistence), and objective performance (accuracy).

Results: The mastery-oriented frame significantly increased all measures of engagement (self-report, time-on-task, persistence) compared to control. The autonomy-supportive frame significantly increased time-on-task but not self-reported motivation. Critically, despite these strong effects on engagement, neither motivational frame produced a statistically significant improvement in task accuracy compared to the control condition.

Conclusion: The findings reveal a clear effort-performance gap: strategically framed language effectively boosts motivation and effort but does not automatically translate into higher quality performance on a cognitive task. This underscores the need for managers to pair motivational communication with investments in employee skill and task design to reliably convert increased effort into improved outcomes.

Keywords: Motivational Communication; Effort-Performance Gap; Self-Determination Theory; Autonomy Support; Mastery Orientation; Task Performance; Natural Language Processing

1. Introduction

The pursuit of a motivated and high-performing workforce is a perennial goal for organizations. Leadership communication is widely recognized as a critical lever in this endeavor, with theories like Self-Determination Theory (SDT) providing a robust framework for understanding the psychological needs autonomy, competence, and relatedness that drive human motivation (Tao et al., 2022). Concurrently, advances in Natural Language Processing (NLP) offer new tools to codify and test specific linguistic strategies that can activate these needs (Dhanani et al., 2023).

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However, a critical assumption often goes unchallenged: that increased motivation and engagement will directly and inevitably lead to improved task performance. While intuitively appealing, this assumption may be an oversimplification. A growing body of evidence suggests a more nuanced relationship. Meta-analytic findings indicate that intrinsic motivation is a stronger predictor of performance for creative tasks than for routine or algorithmic ones (Cerasoli et al., 2014). This potential disconnect, termed the "effort-performance gap" (Nagle, 2021), raises a crucial question for both theory and practice: can motivational language drive effort without concurrently improving performance?

Furthermore, not all motivational strategies may be equally effective. While SDT underscores the importance of both autonomy and competence, the specific linguistic routes to fulfilling these needs may have divergent outcomes. For instance, autonomy-supportive language that offers choice might be perceived as "illusory" if not backed by genuine structural empowerment (Wang & Zhang, 2023), potentially influencing behavior without affecting self-reported motivation. In contrast, mastery-oriented language that emphasizes challenge and growth may more reliably engage both the affective and behavioral systems.

This study addresses these gaps by conducting a controlled experimental test of two distinct, NLP-informed communication frames. Our research objectives are:

- To compare the effects of autonomy-supportive and mastery-oriented communication frames on both behavioral engagement (effort) and objective task performance (accuracy).
- To empirically test for the presence of an "effort-performance gap" in the context of motivational communication.
- To investigate the differential effectiveness of these frames in eliciting self-reported versus behavioral outcomes.

By doing so, we aim to provide a more nuanced understanding of what motivational communication can and cannot achieve, offering critical insights for leaders and organizations.

2. Method

A between-subjects, randomized controlled trial (RCT) design was employed. Participants were randomly assigned to one of three conditions defined by the framing of task instructions:

- Mastery-Oriented Frame (n=67): Instructions focused on challenge, competence, and learning (e.g., “This is a chance to master a new skill…”, “Your growth in this task is key…”).
- Autonomy-Supportive Frame (n=66): Instructions emphasized choice and personal agency (e.g., “You might choose to…”, “Feel free to…”).
- Neutral/Control Frame (n=65): Purely informational, transactional instructions (e.g., “Proceed to the next task.”).

A power analysis using G Power software for a one-way ANOVA with three groups, a medium effect size (f=0.25), an alpha of .05, and power of 0.80 indicated a minimum sample of 159. We recruited 210 working professionals via online platforms (Prolific, Amazon Mechanical Turk). After data cleaning, the final sample was 198 participants (Mean age = 34.2, SD = 8.2; 55.1% female). Randomization checks confirmed no significant differences between groups on age, gender, job tenure, or baseline motivation (all *p* > .05).

The experiment was conducted online. After providing informed consent and completing demographic and baseline measures, participants were randomly assigned to a condition and received the corresponding framed instructions for the main task a set of 10 Remote Associates Problems (RAPs). The software logged time-on-task and performance. Subsequently, participants were offered an optional, more challenging bonus task; their choice to attempt it was recorded. All participants then completed post-task questionnaires before being debriefed.

Independent Variable: Communication frame (Mastery, Autonomy, Control).

Dependent Variables:

- Self-Reported Motivation: Interest/Enjoyment subscale of the Intrinsic Motivation Inventory (IMI).
- Self-Reported Engagement: Utrecht Work Engagement Scale (UWES-9), adapted for the task.

2.1. Behavioral Engagement

- Time-on-Task: Total seconds spent on the main RAP task.
- Persistence: Binary choice (yes/no) to attempt the optional bonus task.
- Task Performance: Accuracy rate (%) on the main RAP task.

Data were analyzed using IBM SPSS Statistics (Version 28) with an alpha of .05. One-way ANOVAs were used for continuous variables, followed by Tukey's HSD post-hoc tests. A Chi-Square test was used for the persistence measure.

3. Results

3.1. Descriptive Statistics

Table 1 presents the means and standard deviations (M and SD) for all primary dependent variables across the three conditions. One-way ANOVAs revealed no significant pre-existing differences between groups on demographic or baseline variables.

Table 1 Means and Standard Deviations for Primary Dependent Variables by Condition

Dependent Variable	Autonomy Frame (n=66)	Mastery Frame (n=67)	Control Frame (n=65)
Intrinsic Motivation (IMI)	4.75 (1.05)	5.10 (0.95)	4.40 (1.18)
Task Engagement (UWES-9)	4.90 (0.88)	5.25 (0.82)	4.55 (1.02)
Time-on-Task (seconds)	345.2 (45.6)	362.8 (50.1)	315.5 (52.3)
Task Performance (Accuracy %)	68.2% (12.1)	71.5% (10.8)	65.8% (14.5)

3.2. Effects on Self-Reported and Behavioral Engagement

A one-way ANOVA on self-reported intrinsic motivation showed a significant main effect, $F(2, 195) = 6.24$, $p = 0.002$. Post-hoc tests revealed that the Mastery frame (Mean = 5.10, Standard Deviation = 0.95) led to significantly higher motivation than the Control frame (Mean = 4.40, Standard Deviation = 1.18, $p = 0.001$). The Autonomy frame (Mean = 4.75, Standard Deviation = 1.05) was not significantly different from the Control ($p= 0.110$).

Similarly, for self-reported engagement, a significant main effect was found, $F(2, 195) = 9.12$, $p < 0.001$. The Mastery frame ($M = 5.25$, $SD = 0.82$) led to significantly higher engagement than both the Autonomy ($M = 4.90$, $SD= 0.88$, $p = .035$) and Control frames ($M= 4.55$, $SD= 1.02$, $p< .001$).

For behavioral engagement (time-on-task), a significant main effect was found, $F(2, 195) = 12.89$, $p < 0.001$. Post-hoc tests showed that both the Mastery frame ($p < 0.001$) and the Autonomy frame ($p < 0.001$) led to significantly more time-on-task than the Control frame. The Mastery frame also led to significantly more time-on-task than the Autonomy frame ($p = 0.048$).

A Chi-Square Test of Independence showed a significant association between communication frame and task persistence, $\chi^2(2) = 8.15$, $p = 0.017$. Participants in the Mastery frame (58.2%) were significantly more likely to attempt the bonus task than those in the Control frame (36.9%).

3.3. The Effort-Performance Gap: Effects on Task Accuracy

A one-way ANOVA on task performance (accuracy) revealed a marginally non-significant main effect, $F(2, 195) = 2.99$, $p = 0.052$. Although the means trended in a positive direction (see Table 1), with the Mastery frame showing the highest accuracy, the differences between groups did not reach statistical significance. This indicates that while motivational frames increased effort, they did not reliably improve performance quality.

4. Discussion

This study provides a nuanced dissection of the effects of motivational communication, revealing a critical distinction between driving engagements and improving performance. Our findings offer two primary contributions to the literature.

First, we document a clear effort-performance gap. Both mastery-oriented and autonomy-supportive frames were successful in boosting behavioral effort, as evidenced by increased time-on-task. The mastery frame also enhanced self-reported motivation and persistence. However, these significant investments of energy and effort did not translate into a statistically significant improvement in task accuracy. This result provides direct experimental support for theoretical models that decouple motivation from performance in certain contexts (Cerasoli et al., 2014; Tao et al., 2022). The cognitive nature of the Remote Associates Task, which relies heavily on insight and fluid intelligence, likely created a ceiling where increased effort could not easily overcome inherent task difficulty or individual cognitive constraints. This underscores that motivational interventions are not a universal panacea for performance deficits.

Second, our results highlight the differential effectiveness of motivational frames. The mastery-oriented frame emerged as the most robust, consistently enhancing both the experiential (self-report) and behavioral dimensions of engagement. This aligns with SDT's emphasis on competence as a powerful driver of motivated behavior.

In contrast, the autonomy-supportive frame presented a more complex picture: it significantly increased time-on-task but failed to boost self-reported motivation or engagement compared to control. This dissociation suggests that linguistic cues of choice may prompt deeper cognitive processing or exploration manifesting as increased time spent without making the task feel more enjoyable or meaningful. This pattern is consistent with the concept of "illusory autonomy" (Wang & Zhang, 2023), where rhetorical offers of choice, in the absence of genuine structural empowerment, may influence behavior through different psychological pathways than those that govern affective responses.

4.1. Practical Implications

The practical implications of this study are twofold. Positively, managers can be confident that using mastery-oriented language (e.g., "This is a chance to develop your expertise in...") is a reliable, evidence-based strategy for increasing employee effort and willingness to take on challenges. However, a crucial cautionary note is also necessary: leaders must not assume that heightened engagement will automatically yield better results. To bridge the effort-performance gap, motivational communication must be paired with strategic investments in employee training, resource allocation, and thoughtful task design that enables effort to be effectively channeled into high-quality performance.

4.2. Limitations and Future Research

This study has limitations that offer avenues for future research. The use of a short-term, online task calls for field experiments to examine long-term effects in real organizational settings. Future studies should systematically vary task type (e.g., creative vs. procedural) to map the boundary conditions of the effort-performance gap. Furthermore, investigating how individual differences (e.g., cognitive ability, proactive personality) moderate the effect of these frames would provide a more personalized understanding of motivational communication.

5. Conclusion

This research demonstrates that the link between motivational language and performance is more complex than often assumed. We found that while strategically framed communication is a powerful tool for boosting employee effort and engagement, its ability to directly improve task performance on a cognitive task is limited. By identifying this effort-performance gap and clarifying the distinct effects of autonomy-supportive and mastery-oriented language, this study provides a more sophisticated and actionable understanding for leaders seeking to energize their teams and achieve sustainable performance outcomes.

Compliance with ethical standards

Acknowledgments

The authors declare that this research was conducted independently and did not receive any external funding or institutional support.

Disclosure of Conflict of Interest

The authors declare no conflict of interest.

Statement of Ethical Approval

The study was conducted in accordance with established ethical standards for research involving human participants. Ethical approval was not required as the research involved minimal risk and anonymous data collection through an online experimental platform.

Statement of Informed Consent

Informed consent was obtained electronically from all participants prior to their participation in the study.

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