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The Moderating Effects of Task Complexity on the Relationship Between Regulatory Foci and Safety and Production Performance

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Regulatory foci of promotion and prevention have been shown to relate differentially to occupational safety and production. This research proposes that task complexity can help explain the differences reported between these 2 self-regulatory processes and safety and productivity performance. Results revealed that promotion is positively related to production and prevention is positively related to safety regardless of task complexity. However, when task complexity is high, promotion negatively relates to safety and prevention negatively relates production. Implications for work motivation theory and research, as well as avenues for future research, are discussed. Practical implications for managerial interventions to optimize both safety and productivity are also presented.

Keywords: regulatory focus, task complexity, safety, production, performance

Organizational[1] researchers (e.g., Kaminski, 2001; Probst, 2002; Zohar, 2000) have begun to investigate the idea of *competing* performance goals—namely, safety and productivity—in organizational settings. Clearly, both of these performance goals are important and understanding if and when employees focus on one at the expense of the other can have far-reaching effects for organizations (cf. Hofmann & Tetrick, 2003; Zohar, 2003). Previous studies have investigated safety and performance goals, and several have found that a tradeoff does exist (Janssens, Brett, & Smith, 1995; Pate-Cornell, 1990; Wallace & Chen, 2006), whereas other studies have shown that individuals can exhibit high levels of both safety and productivity performance (cf. Forster, Higgins, & Bianco, 2003). We believe that this research needs to be extended to investigate when employees exhibit high safety *and* productivity performance and when they only exhibit high safety *or* productivity performance.

One possible key to understanding the tradeoff between safety and productivity performance involves investigating how an individual strives for his or her goals through focus on regulatory activity (called *regulatory focus*). Although the two components of regulatory focus, prevention and promotion, have been shown to relate both positively and negatively to safety and productivity performance (Forster et al., 2003; Wallace & Chen, 2006; Wallace, Chen, & Kanfer, 2005), we suspect that the nature of the task may explain these differences and offer insight into why in some cases safety and productivity goals can be reached simultaneously and why in other cases one goal is reached at the expense of the other. The present research compliments and extends previous work (Wallace & Chen, 2006) by investigating how task complexity influences the relationship between the regulatory focus components (promotion and prevention) and safety and productivity performance (see Figure 1). Understanding performance differences and how one's regulatory focus influences performance will inform managers as to whether and how they can develop techniques both to design work tasks that optimize safety and productivity and to manage employees in a manner that optimizes effectiveness (Hofmann & Tetrick, 2003).

Regulatory Focus Theory (RFT)

RFT is rooted in older psychological theories such as needs theory (Maslow, 1965; Ronen, 1994), values theory (Schwartz, 1992), and job interests theory (Holland, 1985). RFT builds upon the fundamental aspects of these theories—namely, the existence of two underlying motives related to (a) safety, security, and conventional job interests and (b) self-actualization, achievement, and artistic/investigative job interests (Higgins, 1997, 2000, 2006; Kluger, Yaniv, &

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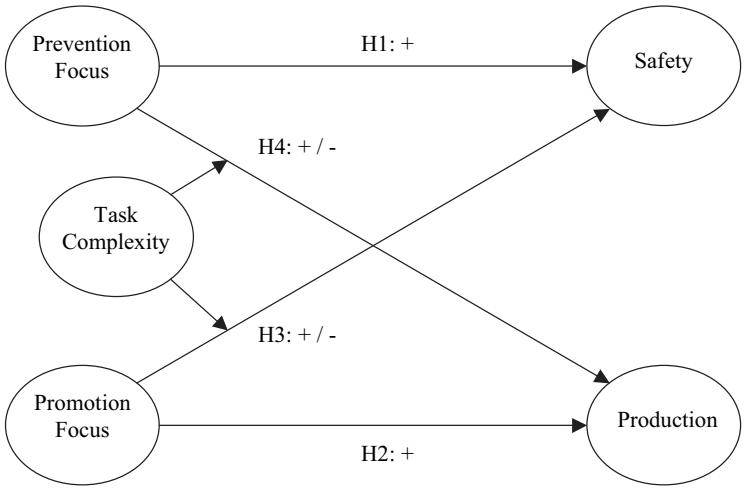

Figure 1. Hypothesized theoretical relationships. Plus and minus symbols represent positive and negative relationships, respectively. H = hypothesis.

Kuhberger, 2000). RFT extends these theories by delineating between two forms of goal pursuit. These two types of regulatory foci are (a) promotion focus, or a focus on accomplishments and gains, and (b) prevention focus, or a focus on safety and responsibility.

Higgins (1997, 2000, 2006) conceptualized regulatory focus as a strategic tendency or concern that influences how persons approach and strive for desired outcomes. A strategic concern or strategy "refers to a pattern of decisions in the acquisition, retention, and utilization of information that serves to meet certain objectives (i.e., 'to insure certain forms of outcome and to insure against others')" (Bruner, Goodnow, & Austin, 1956, p. 54). Thus, regulatory focus reflects the behavioral manifestations of these motivational drivers, as opposed to the motivations themselves (i.e., *how*, as opposed to *why*, people engage in certain goal-striving behaviors; e.g., Forster et al., 2003; Wallace & Chen, 2006; Wallace et al., 2005). Both types of regulatory foci are cognitively based and drive behaviors toward desired outcomes and away from undesired outcomes. Thus, in the larger approach-and-avoid domain (Carver & Scheier, 1981), both prevention focus and promotion focus are in the approach domain in that they both reflect individual striving for desired outcomes (although the means to reach the outcomes differ) rather than avoiding engagement (Higgins, 1997; Higgins, Roney, Crowe, & Hymes, 1994). That is, both promotion and prevention strategies allow one to reduce discrepancies between the current state and the desired outcome (i.e., negative feedback loop) but use different means to reduce these discrepancies. To help clarify, Higgins et al. (2001) stated that, although "both promotion and prevention involve motivation to approach or attain a new task goal, they differ in their orientations toward how to successfully attain the goal" (p. 21). Thus, different approach (promotion) and avoidance (prevention) *strategies* can be used in the service of the same general approach system. A promotion focus is captured by an eagerness strategy that allows quick task completion and a possible higher yield of tasks over time leading to more accomplishments. A prevention focus is captured by a vigilant strategy that allows successful task execution by avoiding potential barriers or hazards to ensure correct task completion (Wallace & Chen, 2006).

Regulatory focus stems from both stable-person characteristics, such as basic needs and values, and malleable contextual stimuli, such as leadership and group norms (see Forster et al., 2003; Higgins, 1997, 2000; Wallace & Chen, 2006). Higgins (1997, 2000) and colleagues (e.g., Forster et al., 2003) have argued that, similar to other nonability constructs (e.g., goal orientation), individual differences in regulatory focus (i.e., chronic tendencies) predispose the individual toward different forms of strategic engagement (promotion or prevention) but do not necessarily de-

termine the courses of action one will take across all situations and contexts. Certain powerful contextual variables such as group norms, leadership climate, and task characteristics may override chronic tendencies and significantly influence whether one adopts a promotion or prevention focus during a given goal-striving episode. Based on this, Wallace and Chen (2006) defined (a) a promotion focus as a moderately stable engagement strategy with a focus on accomplishing more tasks, more quickly, and (b) a prevention focus as a moderately stable engagement strategy with a focus on performing tasks accurately and in accordance with one's duties. Research has been supportive of this distinction in both basic (e.g., Crowe & Higgins, 1997) and applied research (e.g., Brockner & Higgins, 1997; Wallace & Chen, 2006; Wallace et al., 2005).

Safety, Productivity, and Regulatory Foci

Building upon the earlier discussion, it is important to consider how regulatory foci influence performance patterns. Although both regulatory foci can lead to high levels of effectiveness, some studies have shown that a promotion focus yields higher productivity at the expense of safety as the focus is on quickly completing more tasks to gain more accomplishments (i.e., eagerness strategy), whereas a prevention focus yields higher safety performance at the expense of productivity as the focus is on completing the task without errors (i.e., vigilance strategy; cf. Beersma et al., 2003; Forster et al., 2003; Wallace & Chen, 2006; Woodworth, 1899). For example, in complex laboratory tasks, Forster and colleagues (2003) demonstrated that a promotion focus led to quicker completion of a proofreading task, but with more errors, whereas a prevention focus led to slower completion of the same task with fewer errors. Additionally, Wallace and colleagues (Wallace & Chen, 2006; Wallace et al., 2005) found a positive and significant relationship between promotion focus and productivity performance and between prevention focus and safety performance.

Thus, a promotion focus is likely to lead to higher productivity because of the utilization of an eagerness strategy, whereas a prevention focus is likely to lead to higher safety because of the utilization of a vigilant strategy. Thus, we hypothesized the following: *Hypothesis 1:* A prevention focus is positively related to safety performance. *Hypothesis 2:* A promotion focus is positively related to productivity performance.

Moderating Role of Task Complexity

As mentioned earlier, there is some support for the idea that individuals, during some tasks, may only have enough cognitive resources to pursue one goal. Thus, it may be that productivity and speed are sacrificed in favor of accuracy and safety with a prevention focus and vice versa with a promotion focus (Forster et al., 2003; Wallace & Chen, 2006); however, during other tasks, promotion and prevention will positively relate to both safety and productivity. We posit that the complexity of the task may help explain these different findings. For example, in less complex tasks, Forster et al. (2003) found that promotion positively and significantly influenced accuracy and speed and that prevention positively and significantly influenced speed and accuracy. Wallace et al. (2005) found no significant relationship between prevention and productivity performance or promotion and safety performance and Wallace and Chen (2006) found a significant, negative relationship between prevention and productivity performance and between promotion and safety performance.

Task complexity was described in detail by Wood (1986) and comprises required acts (i.e., a pattern of behaviors with an identifiable common purpose), information cues (i.e., specific descriptions of stimuli needed for a given task), and associated products (i.e., measurable results of acts). Required acts (as one task input), together with information cues and associated products (combined as the other task input), can describe any task. Task complexity describes the relationship between the two task inputs and can be partitioned into three types of complexity: component, coordinative, and dynamic. Component complexity can be captured by the number of acts that the task contains and the similarity of those acts. The more dissimilar acts are involved in a given task, the more component complexity is involved. Coordinative complexity refers to the relationships between task inputs and outputs. When the relationship is clear between input and outputs, coordinative complexity is low, but when the relationship between inputs and outputs is less clear and nonlinear, coordinative complexity is high. Finally, dynamic complexity refers to nonstatic relationship between task inputs and outputs (i.e., changes in the means–end relationship). The greater the change in the relationships between inputs and outputs, the more dynamic complexity is involved.

Complex tasks often result in performance decrements because of the wide variety of cognitive ele-

ments required for successful completion. On a simple task, cognitive resources are not stretched by the active seeking of performance strategies while performing the task. Thus, an individual can easily complete the task safely and productively using a variety of strategic means. As the individual is faced with a complex task, their resources are devoted to actively searching for an effective strategy through self-regulation that diverts resources away from the task while he or she is engaged in the task (Kanfer & Ackerman, 1989). As such, in complex tasks, a prevention strategy is likely to lead to safety at the expense of productivity and a promotion strategy is likely to lead to productivity at the expense of safety. During the completion of tasks that are low in complexity, a promotion focus will not require enough resources to make safety goals difficult to obtain; in fact, the approach-related nature of the promotion strategy should result in increased safety performance. The same logic can be applied in relation to prevention focus and productivity.

Some support for these assumptions can been gleaned by examining the pattern of results found by Wallace et al. (2005) and Wallace and Chen (2006). With the use of supervisor performance evaluations of safety (i.e., extent to which employees accurately comply with safety-related rules and regulations) and productivity (i.e., extent to which employees perform numerous work tasks in a short amount of time), the results demonstrated that safety and productivity performance were sometimes positively related and sometimes negatively related. For instance, when these two facets of performance were positively related, promotion and prevention were positively related to safety and productivity. However, when safety and production were negatively related, promotion positively related to productivity and negatively related to safety, whereas the reverse pattern of relationships was found with regard to prevention. Wallace and Chen did not investigate why this occurred, but this pattern of relationships could be attributable to the complexity of job tasks so that, in tasks that are more complex, a tradeoff exists because of allocation of limited resources toward performance goals.

Take, for example, airport security screeners. They are primarily charged with the task of processing passengers as quickly and safely as possible. When passenger traffic is light, there are fewer demands placed on the resources of the screeners; therefore, they are able to be quick (productive) and safe in processing passengers though security. However, on busy travel days (e.g., Monday mornings, Friday afternoons), many more demands are placed on security screeners' resources to be both quick and accurate; therefore, screeners may only be able to effectively devote enough resources toward one type of goal.

Take another example, a combat soldier. Similar to the security screener's situation described earlier, some combat situations may be less complex than others. For example, the weather may be fairly clear, the enemy may be easily detected, and adequate cover may be available to provide protection from the enemy. In these situations, individuals may be able to focus both on productivity and safety. They can ensure more personal safety by utilizing protective cover while also engaging the enemy by firing rapidly from this protective cover. However, when the situation is more complex—perhaps the weather is not clear, the enemy is hard to detect, and adequate cover is not available—individuals may be able to achieve only one goal: safety (i.e., taking cover) or productivity (i.e., opening fire) because of limited resources. Thus, their personal safety may be compromised while they fire their rifle as much as possible, or they may take means to ensure personal safety by taking cover and waiting for one good shot.

These examples serve to highlight the similarity between accuracy and safety because the demands and processes required to work safely are quite similar to those required to work accurately; namely, a focus on prevention of errors and mistakes. A similarity also exists between speed and productivity because faster work rates can increase productivity. Although these are not analogous relationships, the critical connection between these intuitively similar types of behavior (accuracy/safety and speed/productivity) has been suggested to be one's regulatory focus (Wallace & Chen, 2006). Furthermore, research predicts that accidents are more likely to happen if the speed (and therefore productivity) of the job is increased (Kaminski, 2001; Probst, 2002).

Previous research on self-regulation supports these ideas in that both self-regulatory processes and task complexity can greatly deplete cognitive resources (Baumeister, Bratslavsky, Muraven, & Tice, 1998). In addition, this depletion of resources can negatively affect performance on the task at hand (Muraven, Tice, & Baumeister, 1998). Regulatory processes require cognitive resources during task performance, and complex tasks require more cognitive resources than simple tasks (Kanfer & Heggestad, 1997). As a task becomes more complex, the performer has no choice but to focus limited cognitive resources on one type of goal. In easy tasks, both promotion and prevention foci have been found to positively relate to safety and productivity performance, suggesting

that, in these tasks, the approach nature of both foci positively influences both types of performance. However, in complex tasks, task demands force a choice between goals to better allocate diminishing resources. In terms of safety and production performance, it is expected that prevention will positively relate to production in less complex tasks and negatively relate to production in more complex tasks, whereas promotion will positively relate to safety in less complex tasks and negatively relate to safety in more complex tasks. Thus, we hypothesized the following: *Hypothesis 3:* The relationship between promotion and safety is dependent on task complexity in such a manner that a positive relationship is expected for less complex tasks and a negative relationship is expected for more complex tasks. *Hypothesis 4:* The relationship between prevention and production is dependent on task complexity in such a manner that a positive relationship is expected for less complex tasks and negative for more complex tasks.

Method

Participants

The present study had a sample of 151 participants recruited from a university in the southern United States. The average age of the sample was 19.5 ($SD = 1.8$) and consisted of Caucasians (89%), Asian Americans (7%), Hispanic Americans (2%), and African Americans (2%). Ninety women and 61 men participated.

Experimental Setting

The task used was a PC-based attack helicopter simulation called Comanche 4. This task environment is similar to that used by Chen, Thomas, and Wallace (2005) and Marks, Sabella, Burke, and Zacarro (2002; Experiment 1). However, this simulation was used for individual performance, not team performance. Each participant was responsible for (a) flying a helicopter, (b) firing weapons, (c) escaping enemy antiaircraft fire, (d) radar surveillance (e.g., identification of enemy or friendly targets), (e) weapon selection and management, and (f) system monitoring (e.g., monitoring helicopter damage). The task required individuals to attack primary and secondary enemy targets (e.g., antiaircraft artillery, tanks, armored vehicles) positioned along prespecified waypoints while avoiding antiaircraft artillery and protecting allies.

Following Wood's (1986) task complexity model, we made the task more (or less) complex by changing the level of three types of complexity. The complex task was more complex in all three types of task complexity, compared with the simple task. In the simple task, participants encountered a terrain that was flat, and visibility was clear. In the complex task, the terrain was more difficult, and visibility was not as clear, requiring the same knowledge but more attentional resources. To manipulate coordinative complexity, the complex task involved more types of enemies and weapon strategies; thus, the participants were required to utilize a larger amount of different strategies to successfully complete the task. Most important, the complex task included more dynamic complexity than the simple task, requiring increased and more complex relations between the coordinative and component complexity of the task. The complex task scenario involved moving targets; thus, the relationship between coordinative and component complexities was more dynamic. As the targets moved within the scenario, the participants were required to track these targets and their movement in addition to using different attack strategies with relation to the position and type of target encountered. In the present simulation, complexity was not simply manipulated by increasing task load (i.e., adding more targets and more "friendlies") but was made more or less complex by changing the relationships among task components and strategies (Wood, 1986). Composite scores (i.e., total scores) on the more complex task ($M = 363.5$; $SD = 198.2$) were significantly lower than those on the less complex task ($M = 597.2$; $SD = 206.1$), $t(148) = 6.34$, $p < .05$, which indicates that the complex mission was significantly more complex.

Procedure

Before training, participants completed the regulatory focus measure and then were randomly assigned to either an easy or a complex condition. Next, participants were trained on the simulation before task engagement to ensure that all participants reached minimal competence on the simulation. Throughout training, experimenters ensured that each participant could complete all critical tasks, which were chosen on the basis of a thorough task analysis. If a participant failed to correctly complete a task during training, the experimenter coached the participant until he or she was able to accomplish it alone before moving on with training. Training for each participant lasted approximately 2 hr. To ascertain whether participants reached a minimally acceptable level of competency and knowledge, we gave each participant a knowledge test for the training. A short 10-item test was developed to assess training knowledge. In consistency with the studies of Ford et al.

Table 1
Descriptives and Bivariate Correlations for Study Variables

Variable	*M*	*SD*	1	2	3	4	5
1. Promotion	3.19	1.11	*.84*				
2. Prevention	3.32	1.06	−.15	*.82*			
3. Production	348.89	189.37	.24*	.25*	—		
4. Safety	134.45	72.58	−.35*	.42*	.23*	—	
5. Task complexity	0.02	1.01	−.15	.45*	.40*	.55*	—

*$p < .05$.

(1998), Kozlowski et al. (2001), and Chen et al. (2005), items on these tests covered both declarative and procedural/strategic knowledge. A review of the test by three subject matter experts revealed that the test captured the main content domain that was being taught. Participants were given 1 point for each correct answer; scores on the tests ranged between 0 and 10. If participants did not meet the minimum requirements (i.e., score of 7), they were retrained in the areas in which they were deficient. Before the performance mission, each participant was given a mission briefing that described the mission. Included in this briefing was a color topographical map of the area and several intelligence reports about enemy targets and locations. Each participant was given 10 min to review and plan for the performance mission, which lasted 15 min.

Measures

Regulatory focus. Promotion and prevention focus items were adapted for use in the present simulation on the basis of items reported in studies by Lockwood, Jordan, and Kunda (2002) and Wallace and Chen (2006). Examples include the following: "Overall, I am more oriented toward achieving success than preventing failure when completing tasks" (prevention); "In general, I am focused on achieving positive outcomes when completing tasks" (promotion). Each factor contains six items. The scale uses a 5-point Likert format ranging from 1 (*never*) to 5 (*constantly*), and both factors were found to be internally consistent (for promotion, $\alpha = .84$; for prevention, $\alpha = .82$).

Performance. We assessed performance using simulation scores of performance. Individual scores on the performance mission provided a quantifiable score for both the number of enemies eliminated (i.e., production) and damage to one's own helicopter and friendlies (i.e., safety). The maximum score for production was 550, and the maximum score for safety was 350. Because of these differences in possible total scores (i.e., more points for production), *z* scores were created and used in regression analyses.

Results

Descriptive statistics and bivariate correlations can be found in Table 1 across all participants, regardless of mission complexity. Prevention was positively related to both safety and productivity, whereas promotion was positively related to productivity and negatively related to safety. These results confirm what has typically been found in the few studies investigating these relationships (e.g., Forster et al., 2003; Wallace et al., 2005), but these studies did not take into account the moderating influence of task complexity among regulatory focus and safety and production performance.

Before testing the hypotheses, we centered predictor data before creating the interaction terms to help control for any spurious effects due to possible multicollinearity between the predictors and the interaction term. This process is recommended by Aiken and West (1991), who stated "the multicollinearity in the context of regression with higher order terms [interaction terms] is due to scaling, and can be greatly lessened by centering variables" (p. 35). We used hierarchical moderated regression to test the hypotheses. At the first step, gaming experience was entered to control for prior experience with simulation games when predicting safety and production in separate regressions. Next, promotion, prevention, and task complexity were entered in each regression. Finally, the interaction terms between promotion and task complexity and between prevention and task complexity were entered into each equation. Results fully supported the expectations outlined in the introduction, and results for each step can be found in Table 2. To summarize, it was found that promotion positively related to productivity and that prevention positively related to safety regardless of complexity. These results fully support Hypotheses 1 and 2.

Table 2
The Moderating Effect of Task Complexity on the Regulatory Foci Performance Relationships

Variable	Dependent variable = safety				Dependent variable = production			
	ββ	*t*	R^2	ΔR^2	β	*t*	R^2	ΔR^2
Step 1								
Gaming experience	0.03	0.34	.00	.00	0.12	1.458	.01	.01
Step 2								
Gaming experience	0.04	0.69			.14	1.95		
Task complexity	0.43	5.71*			.39	4.72*		
Promotion focus	−0.26	−3.79*			.31	4.22*		
Prevention focus	0.19	2.52*	.39*	.39*	.13	1.65	.28*	.27*
Step 3								
Gaming experience	0.05	0.73			.14	1.91		
Complexity	0.46	5.45*			.31	3.32*		
Promotion focus	−0.24	−3.11*			.25	2.91*		
Prevention focus	0.13	1.22			.29	2.44*		
Promotion × task complexity	0.18	2.36*			−.07	−0.88		
Prevention × task complexity	0.02	0.17	.44*	.05*	.20	2.01*	.32*	.04*

*$p < .05$.

Also as expected, we found that prevention differentially related to productivity and that promotion differentially related to safety when taking into account task complexity. The significant interactions of Promotion × Complexity on safety and Prevention × Complexity on productivity are displayed in Figures 2 and 3 and fully support Hypotheses 3 and 4. These figures show that, in complex conditions, there is a negative relationship between promotion and safety and a negative relationship between prevention and productivity. However, in easy conditions, there is a positive relationship between promotion and safety and between prevention and productivity.

Discussion

Previous research has revealed different associations between regulatory focus and performance facets of safety and productivity; this study set out to understand why. To reiterate, some research has found that promotion is positively linked to speed and that prevention is positively linked to accuracy (Forster et al., 2003), whereas Wallace and colleagues (Wallace & Chen, 2006; Wallace et al., 2005) have found that promotion is positively associated with productivity and that prevention is positively associated with safety. Although these relationships

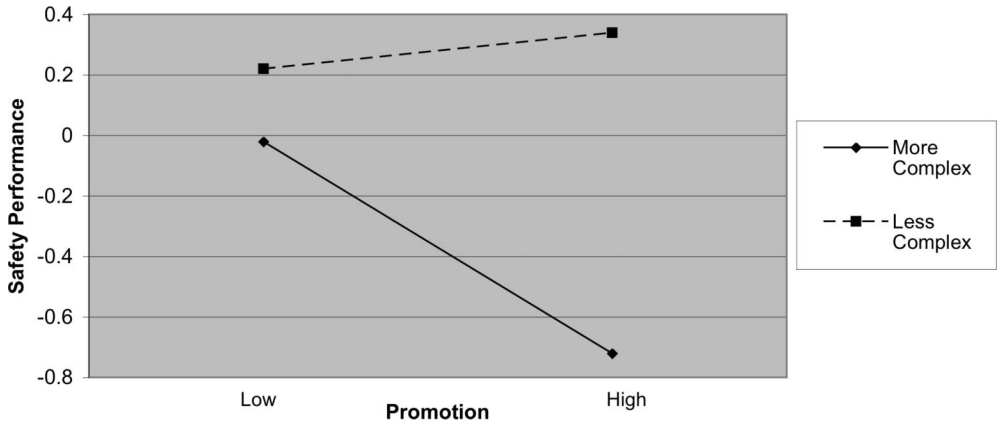

Figure 2. Task Complexity × Promotion on Safety Performance.

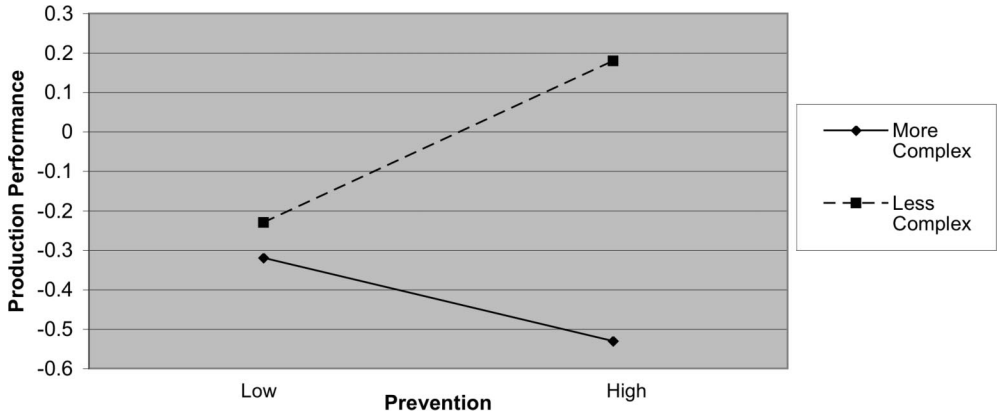

Figure 3. Task Complexity × Prevention on Production Performance.

are consistent, the differences revolve around the association that promotion shares with accuracy and safety and the association that prevention shares with speed and productivity. Wallace and colleagues have posited that the differences are due to the complexity of the tasks being completed. In the present study, we set out to empirically answer this question. Particularly in complex tasks, an employee must choose to allocate resources between producing more at the sake of safety or to be safe at the sake of productivity.

The present investigation has supported these beliefs. Returning to our two examples (security screener and combat soldier), when the situation is less complex, a person is more able to be productive and safe. He or she is able to accurately and efficiently carry out his or her tasks effectively. The results of this investigation predict that when the complexity of the task increases, this individual can only focus on one goal—safely or quickly processing passengers for the screener and accuracy in aim or speed in firing for the combat soldier. What cannot be confirmed in the present study is a prediction of what regulatory strategy (i.e., promotion or prevention) an employee will utilize. Future research is needed to uncover such predictions. Thus, the results do reveal that an employer cannot simply ask an employee to be both highly productive and complete tasks in the safest possible fashion in highly complex tasks.

This creates a need for managers to either manage the complexity of the task or manage employee's regulatory focus on the basis of the demands of the task to help direct employee behavior toward optimizing safety and productivity. Recall that research has suggested that, although regulatory focus stems from stable-person characteristics, it can also be influenced by context. In fact, Wallace and Chen (2006) stated that "performance might be optimized for jobs in which safety is not a concern by emphasizing a promotion focus, but in jobs where safety is a concern a prevention focus should be emphasized" (p. 28). This study has empirically supported this assertion, but as one question was answered, other questions surfaced. First, can managers be trained to influence an employee's regulatory focus, and if so, how? Organizations may be able to improve safety by training leaders and supervisors to increase the salience of possible hazards during task completion. In other words, managers may be able to frame the situation to produce a prevention focus. This may at first appear difficult because of one's moderately stable tendency for promotion and prevention, but theoretically it has been suggested and empirically it has been shown that one's tendency can be changed by powerful contextual stimuli (Crowe & Higgins, 1997; Higgins, 1997, 2000), and we believe that leaders represent such stimuli (cf. Forster et al., 2003; Wallace & Chen, 2006).

It has been suggested that leaders act as framing tools for regulatory focus. For example, Zohar (2002) found that safety improved when leaders communicated known safety issues to subordinates. However, he did not examine whether this created a regulatory style of prevention. Perhaps this was the regulatory mechanism that transformed unsafe behaviors to safe behaviors by refocusing resources toward the goal of safe task execution rather than quick task completion because of the creation and reinforcement of safety norms (Wallace, Popp, & Mondore, 2006). When

supervisors convey safety concerns, it is possible that there are strong norms for behaving safely and employees act on such stimuli as a result of the installation of a prevention focus. This suggests that certain contextual influences affect promotion and prevention focus. When organizational leaders have concerns about safety and train supervisors to recognize and better communicate safety issues to employees, these employees will utilize a prevention focus. If safety is not an issue, perhaps supervisors could frame situations in terms of speed and gains (e.g., production climate) to create a promotion focus. The present study's results suggest that such a plan would be beneficial; what is needed is a better understanding of the best methods to train supervisors to instill one focus or the other on the basis of task demands.

Although the present investigation adds to our understanding of regulatory focus theory and subsequent behavioral outcomes, limitations do exist. For example, this study examined regulatory processes in relation to a combination of cognitive and physical tasks.

Future investigations should examine how these processes relate to purely cognitive tasks (e.g., air traffic control tasks) as well as purely physical tasks in which high performance is viewed differently (cognitive more so through vigilance and physical more so through accomplishments). Although the three aspects of task complexity according to Wood (i.e., component, divergent, and coordinative) were examined, other aspects of task complexity (e.g., perceptions of complexity) may differentially affect safety and production outcomes. Such investigations would better inform us about the generalizability of the results found in the present study.

The present investigation has led to some interesting findings, but future research is needed to examine other moderators of these relationships. Perhaps off-task processes (see Kanfer & Ackerman, 1996; Sarason, 1975) interact with one's regulatory focus in such a fashion that the relationships presented herein would change. Furthermore, it could also be the case that people use job search strategies following their stable inclination for prevention or promotion; thus, they select jobs that create a match between their regulatory focus and the task demands of the job (e.g., prevention individuals may select jobs requiring more vigilance, such as air traffic controllers). Such possibilities hold important implications for selection decisions for jobs that require the completion of highly complex and dangerous tasks. Although we examined how task complexity moderates the regulatory focus–performance relationship within a task, there is also a need to examine these effects across jobs. One method of doing so would be to longitudinally examine regulatory focus strategies across changing job demands.[1] Only future research will answer these questions and reveal further insight into regulatory processes, performance outcomes, and additional mediating and moderating factors.

Conclusion

Research examining safety and productivity is allowing increased insight into the behavioral processes leading to performing job tasks safely and productively. The present research contributes to this literature by demonstrating the moderating role of task complexity. In so doing, a critical component that needs to be managed to optimize safety and productivity has been identified. This is key because it demonstrates the need for managers to be involved in directing employees' focus during highly complex and dangerous tasks.

[1] We thank an anonymous reviewer for pointing this out.

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