

**PERSONALITY AND
PERFORMANCE: WHAT IS THE
ROLE OF NEGATIVE
AFFECTIVITY?**

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Personality and Performance: What is the Role of Negative Affectivity?

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Abstract

The present study examined the importance of four psychological constructs, negative affectivity, worry, self-efficacy, and cognitive interference, in predicting the performance of 113 undergraduate students who completed a computerized managerial decision-making simulation. Results revealed that negative affect and worry were unrelated to performance. Self-efficacy was not predictive of task performance; however, self-reported task-related intrusive thoughts was. PLS analysis of the linkages among these construct, identified cognitive interference as a potent force affecting task outcomes. The study suggests that cognitive interference may be useful in more sharply defining the processes involved with task performance; the malleability of the construct offers the implication that managers should train employees to guard against such intrusions to boost performance.

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Literature Review

Researchers in the organizational domain are showing a resurgence of interest in personality variables (House, Shane & Herald, 1996), due to the prevalent notion that employees colour their experience of work life differently: some shade setbacks and difficulties in immutable greys, while others see the brighter hues and persist in a challenging task. Indeed, challenging tasks are the dominant feature of modern work life, as organizations of today's Information Age place increasingly heightened, and primarily cognitive, demands upon employees (Smith, Ford, & Kozlowski, 1997).

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The pressure of effectively mastering and executing complex tasks results in a varying response among those workers. Differences in task performance and task affective reactions indicate that motivation is a resource to be maximized. Thus, accounting for these individual differences, in hopes of enhancing employees' performance, becomes a critical issue.

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Negative affectivity, the predisposition to a pessimistic worldview, is intuitively a non-motivational attribute, in terms of salience to motivation and performance. Because systems of traits influence behavioural dynamics, the mechanisms through which this trait exerts its effects demand attention (Austin and Klein 1996). This study will delineate the relations between personality, motivation, and performance, in the context of negative affectivity.

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on performance. Carlson, Bozeman, Kacmar, Wright, and McMahan, (2000) explore individual-level antecedents of training motivation heavily reliant on personality variables, reifying the notion that variances in motivation will have implications for organizations.

Although differences in personality traits are important influences on behaviour, actual theory and research into the role of non-ability dispositions remains disorganized and chaotic (Kanfer & Heggstad, 1997). Current literature explores individual differences in the context of narrow and non-integrative streams of research: links to personality and performance are considered as isolated constructs, with mediating roles all but ignored. In this vein, investigating self-efficacy to mediate the task-affective reactions and performance associated with negative affectivity is important in extending prior research, which has not yet offered a holistic aggregation of these constructs.

Essentially, this study explores a notion that originated in Erez & Judge's (2001) research: negative affect contributes to an individual's core self-evaluations, which, in turn, affects both willingness and confidence to perform. That is, core self-evaluations are implicated in resulting motivation-related decisions. Cognitive resource allocation is one such decision. High negative affect individuals are more likely to view tasks in a negative light, and will thus experience lower levels of motivation (Watson, 2000). The motivationally implicated variables of self-efficacy and intrusive thoughts warrant closer scrutiny in this milieu.

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Watson and Clark (1984) define negative affectivity as a stable tendency to experience negative emotions across situations and time. Conceptual components include a tendency to experience high levels of negative emotions, react negatively to stressful situations, maintain high levels of negative affect even in the absence of stress, focus on subjective experiences (i.e., ruminate), and manifest high levels of somatic and psychological distress. Drawing from the inter-correlations among various negative affectivity measures, the authors found a pervasive tendency in high negative affect individuals to dwell on the negative aspects of themselves and the world in general. The authors consider this a mood-dispositional dimension. As such, the experience of negative emotions occurs even in the absence of aversive environmental events. This predisposition towards a negative construal of life events leads to self-recrimination, dissatisfaction, and distress.

Discussions of negative affectivity appear most extensively in the literature within the work-stress domain, in particular regard to job stressors and strains (e.g., Bolger and Zuckerman, 1995; Griffin, 2001; Spector & O'Connell, 1994). Highly negative affective individuals, congruent with their general tendency toward negative emotions, experience poor attitudes (namely, dissatisfaction) at work, as well as high levels of stress (Watson & Clark, 1984). Investigating experiences of stress and personal achievement among consultant doctors, Deary and Blenkinsop (1996) found significant correlations between neuroticism, a proxy for negative affectivity, and many aspects of job-related stress and perceived poor job achievement.

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Bolger and Zuckerman's study (1995), in which subjects completed a two-week diary recording their reactions to daily stressful events, highlights the importance of negative affectivity. Highly negative affective individuals reported greater exposure and negative reactivity to conflicts than low negative affectivity individuals, and the authors conclude that this heightened reactivity to conflict is most detrimental to their affect. Furthermore, the findings reveal that the choices and effectiveness of their coping efforts are weaker. This is almost a direct outgrowth of Watson & Clark's (1984) definition—that the high negative affect individual is characterized by a preoccupation with the thought that things will go awry and the strong emotional reaction to that thought.

Research shows a negative relation between negative affectivity and job satisfaction (e.g., Furnam & Zacherl, 1986; Tokar & Subich, 1997). Connolly and Viswesvaran's (2000) meta-analysis reported a true score relation of -0.33 between negative affectivity and job satisfaction. Such robust findings implicate the negative cognitions characteristic of these individuals: Judge and Locke (1993) found that employees experiencing frequent negative emotions were also susceptible to more dysfunctional job-related thoughts (including perfectionism and global attribution) and lower job satisfaction. Larsen and Katelaar (1991) reported stronger inductions of negative mood in subjects with high neuroticism scores. Lam and Schaubroeck's (2000) study of bank tellers found that negative affectivity moderated the link between favourable appraisal feedback and job attitudes. Watson and Slack (1993)

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found those who experience negative emotions frequently in their work environment also tend to dwell on their failures excessively. In light of these studies, evidence strongly positions high negative affect persons toward experiencing less rewarding task affective reactions. Congruent with prior theory and research findings, then, the following hypothesis is proposed:

- H₁: Negative affectivity will be positively related to negative task affective reactions.

Negative affectivity is also indicative of lower job performance. Specifically, a recent meta-analysis by Salgado (1997) established a negative relationship between neuroticism and job performance. Erez and Judge (2001) similarly found that negative affectivity, whether considered in isolation or as a constitutive element of a broader trait (which they termed “core self-evaluations”), was a significant predictor of poorer task performance, persistence, and motivation in the context of solving anagrams. Others (Barrick & Mount, 1991; Hertz & Donovan 2000) have likewise found the trait related to poorer job performance. Stemming from this is the next hypothesis:

- H₂: Negative affectivity will be negatively related to task performance.

The pattern of ruminations characteristic of high negative affect individuals can have adverse effects on performance. Kanfer and Ackerman (1996) revealed that poorer performers showed reduced persistence on tasks after receiving negative

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feedback, evidencing stronger negative reactions, and more frequent off-task thinking than their better performing counterparts. Based in negative emotions, many of the thoughts reported by the poor performers represent distracting intrusions into task concentration. The chain reaction seems clear: high negative affect persons construe events negatively and ruminate more; these ruminations take away the cognitive resources necessary for success in task performance.

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Additional findings in the stress literature further posit that optimists and pessimists have different coping styles. Optimists are more likely to engage in problem-focused coping to deal with stress (taking direct, constructive action), while pessimists take a more emotion-focused and self-defeating route (Scheier, Weintraub, & Carver 1986). Kanfer and Heggstad's (1997) model predicts that anxiety (which they equate with neuroticism) leads to poor self-regulation because anxious individuals are not able to control the emotions necessary to preserve on-task

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attention. These individuals often perform poorly due to negative mood states and worry over potential failure in evaluative situations (e.g., test performance). Each of the aforementioned studies echoes Wine's (1971) cognitive interference hypothesis in which high test-anxious individuals impede their performance with a tendency to engage in frequent ruminative cognitions and self-evaluative worry—these thoughts diverting attention away from task performance and culminating in lesser outcomes.

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Negative self-focus therefore fuels poor task performance in high negative affect individuals.

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Although research has identified negative affectivity as predictive of both poorer task affective reactions and task performance, less is known about whether certain variables may affect these relationships. In confluence with their psychological and behavioural responses, deemed to be manifestations of their embittered worldview, the downfall of highly negative affect people is their tendency to ruminate on negative aspects of their environments. Fusing together the empirical findings that highly negative affect persons behave less than optimally—by not performing as capably as they might and by not deriving satisfaction when they do function well—the proposition put forth is that they are vulnerable to influences on the root of their behavioural/psychological tendencies: task-irrelevant cognitions.

- H₃: High negative affect individuals will evidence more task-intrusive thoughts than low negative affect individuals.

Scoring high on negative affectivity cannot preclude these individuals from the workforce; thus, more research is needed to better understand the disposition's deleterious effects on job behaviour, and to discern whether any potential exists to overcome it. Examining the mechanisms through which negative affectivity's relation to performance can be altered will yield an understanding of why the construct is a valid predictor of performance. Organizations would gain by harnessing a means to yield more beneficial consequences. Moreover, identifying mitigating conditions under which performance outcomes could vary would determine when tests of personality constructs are most likely to yield high predictive validity and utility.

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There may be individual differences through which negative affectivity's effects on task performance operate. Self-efficacy is of primary concern and is the subject of investigation in this study. The contention is that performance is subject to an individual's emotions, personality, and motivation: personality can either facilitate performance through high levels of motivation and absorption in tasks or debilitate performance through worry over failure, which demoralizes and distracts from task completion (Sarason, Sarason, & Pierce, 1995).

People differ in the degree to which they perceive themselves as capable. This differentiation—self-efficacy—holds implications for negative affectivity's effects on task performance. Highly self-efficacious individuals believe they possess the ability to achieve success (Bandura, 1997). The construct requires that an individual's belief in his capacity to perform be qualified to a specific task: only in this context is it a strong predictor of subsequent task-specific performance and influence on future intentions. Self-efficacy leads to beneficial consequences for the individual—better problem solving, coping skills, and cognitive flexibility (Deci & Ryan, 1987, and O'Leary, 1985).

The relation between self-efficacy and performance is well documented. In a recent meta-analysis incorporating the results of 114 studies, Stajkovic and Luthans (1998) reported a weighted average correlation of 0.38 between self-efficacy and work-related performance. Research shows that high self-efficacy is predictive of both perceived and actual performance in completing a stressful cognitive task

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(Endler, Speer, Johnson, & Fleet, 2001), task affective reactions (Frayne & Latham, 1987), acquisition of computer software skills (Martocchio, 1994), and insurance sales (Barling & Beattie, 1983). (See Stone, 1994; Wolfe, Nordstrom & Williams, 1998; Vancouver, Thompson, Tischner & Putka, 2002 for exceptions.)

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- H4: Self-efficacy will show a positive relation to task performance; high self-efficacy individuals will perform better than low self-efficacy individuals.

Research has investigated the role of self-efficacy as a mediator. While several researchers have found that self-efficacy mediates the relationship between conscientiousness and performance (Barrick, Mount & Strauss 1993; Gellatly, 1996; Martocchio & Judge, 1997), there has been less inclination to explore the linkages between personality, motivation, and performance within the context of negative affectivity, which is intuitively less motivational in nature than conscientiousness. We might hypothesize a similarly mediated pathway between negative affectivity and performance. Indeed, much of the research on self-efficacy and depression depicts self-efficacy as a construct serving either a mediating or buffering role between some type of stressor and depression: Pearlin, Lieberman, Menegham, & Mullan (1981) found that job disruptions and economic strains contribute to depression mainly through their negative effects on self-efficacy. Importantly, neurotic individuals, in addition to being less tolerant of stress, are also characteristically lower in self-esteem (Costa & McCrae, 1992).

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Furthermore, there is a widely accepted link between emotional arousal and its negative effect on self-efficacy formation (Kavanagh & Bower, 1985). In essence, the effect of arousal (anxiety) reflects the inverted U-shape of the Yerkes-Dodson law (Yerkes & Dodson, 1908), such that relatively low levels of anxiety serve a motivating function, which facilitates performance, but at higher levels, performance declines (Dobson, 2000). Since high levels of arousal are often associated with reduced performance (i.e., computer performance, Gutek & Winter, 1990), subjects are more apt to consider themselves capable when not experiencing aversive arousal (Bandura, 1997). That is, people partly gage their level of anxiety via their state of arousal;

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therefore, possessing a high level of self-efficacy could alleviate the debilitating feeling of anxiety in high negative affect persons who, by nature, allow distress to permeate their lives.

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Research has demonstrated that stimuli producing self-focused attention (i.e., mirrors, audiences) have a detrimental effect on the task performance of low self-esteem persons; in contrast, the performance of high self-esteem persons remains unaffected by these same factors (Brockner, 1979). For low self-esteem persons, introspection once again proves to be a handicap, one that does not afflict high self-efficacy-possessing individuals. M.M. Bandura and Dweck's (1988) (cited in Bandura, 1997) assertion likewise posits the shift from a task- to a self-oriented focus as responsible for undermining performance outcomes.

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This research has important implications: specifically, high self-efficacy individuals seem to concern themselves with pursuing the task at hand, while high negative affect individuals are more predisposed to low self-efficacy and are impeded by worry-laden, self-focused ruminations. Negative affect individuals create extra-task processing (irrelevant thoughts) that reduce cognitive resources available, and necessary for successful task performance. Negative interpretation of the situation, which focuses on their depressed mood also hinders the development of self-efficacy, a key source of which is emotional response (Bandura, 1997). Both cases pre-empt attentional resources, thus impairing task performance. Thus, self-efficacy, as reduced by intrusive thoughts, is expected to mediate the deleterious effects of negative affectivity upon task performance and task affective reactions. More formally, the following hypothesis is advanced:

- H₅: Self-efficacy mediates the negative affect-performance relation.

A basic premise of the present research is that personality affects performance essentially through its effects on motivation. The motivation-performance model is derived from Bandura (1997), who judges self-efficacy to be the most proximal predictor of performance. In this vein, self-efficacy theory is integral to self-regulation; it is one of the main determinants of effort allocation intentions—relating to self-set goals (Locke & Latham, 1990) and a greater likelihood of engaging, persisting, and eventually succeeding in on-task efforts (Phillips & Gully, 1997). Low self-efficacy persons are less likely to strive to improve their performance because

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they perceive a tenuous link between effort and performance due to felt inadequacies (Martocchio, 1994). On the other hand, high self-efficacy individuals, seeing a direct link between effort and performance, are more likely to strive to improve their performance. An important component, though not examined in the present study, is the impact of task performance on subsequent self-efficacy formations and

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strivings. The literature on goals and performance support this (Phillips & Gully, 1997; Lock and Latham, 1990). For example, people with success in previous endeavours then believe in their capabilities and set higher goals for themselves.

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The hypothesized model (see Figure 1, below) thus provides for negative affectivity's inverse relation to performance through lowered self-efficacy, triggered by arousal (state anxiety); this spurs intrusive thoughts and depressed motivation.

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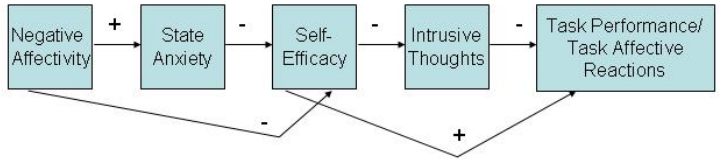


Figure 1. Hypothesized model.

Negative affectivity's relation to task performance and task affective reactions as mediated by anxiety, self-efficacy and intrusive thoughts.

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Method

Task Overview

The task was a simulation of managerial decision-making activity, in which subjects act as managers of an organization involved in furniture production (Wood & Bailey, 1985; Wood & Bandura, 1989; and Wood, Bandura & Bailey, 1990). Subjects were asked to match a set of employees to job requirements, based upon their described characteristics, and to maximize performance using goals, instructive feedback and social rewards. A mathematical model then calculated the hours taken to complete the production order, based upon the manager's decisions. By correctly matching employees to job requirements, and correctly using the various motivational options, the time necessary to complete the production order declined, indexing better managerial performance.

Measures

Performance. Performance was operationalized as the number of production hours needed to complete each weekly order, averaged over a five-trial session. The simulation model automatically calculated the number of production hours for each trial, based upon the subject's decisions regarding job assignments as well as selections of motivational factors (Wood & Bailey, 1985). The model reported levels of performance as a percentage of a standard, a higher score signifies a better performance (fewer number of required production hours).

Affect (satisfaction with the task): Affect was assessed via a 5-item self-report scale (e.g., "I was satisfied with my overall performance on the just-completed task");

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“I enjoyed performing this task”; “I think I am pretty good at this task”; I put a lot of effort into this task;” “I found this task to be a useful experience”). Responses are based upon a 5-point Likert scale, with anchors 1 (strongly disagree) to 5 (strongly agree). With the exception of the global measure of satisfaction, items were derived from a 9-item (Ryan 1982), which addresses aspects of intrinsic motivation such as interest, competence, and importance (effort level). The scale holds both convergent and face validity, as it taps the two measures stressed in the affective component of the widely used Job Diagnostic Survey (Hackman & Oldman, 1975): general satisfaction, and internal work motivation. Internal consistency of Ryan’s (1982) scale has been estimated at 0.76 to 0.84 (Steele-Johnson et al, 2000). In this study, Cronbach’s alpha was 0.70.

Negative Affectivity: The Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988) specifically taps NA, using 10 mood descriptors. The list of adjectives includes “irritable, and “distressed,” and respondents indicate the extent to which each of the items describes them, using the time frame “in general” to permit the measurement of NA as a trait, rather than a state variable. Utilizing a 5 point Likert, with anchors 1 (very slightly or not at all) to 5 (extremely), the scale exhibits high internal consistency in both the present study (alpha=0.87) and others (Watson et al, 1988). The PANAS NA measure documents convergent and discriminant validity, and test-retest reliability establishes the scales as stable over time (Watson et al, 1988).

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Anxiety: The index of anxiety directly taps its cognitive dimension, using 9 of the 10 items in the Worry-Emotionality Scale developed by Morris, Davis and Hutchings (1981). The cognitive facet of anxiety concerns specifically the negative expectations and trepidations about one's ability to perform, and the possible consequences of such failure. Sample items include "I feel panicky" (emotionality) and "I feel that others may be disappointed in me" (worry), rated on a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree), as relevant "right now, in relation to this task". The item "I am afraid that I should have studied more for this test" (worry) was dropped; the task presented in the present research held no prior studying requisite. Internal consistency of the scale is high, estimated to be between 0.81 and 0.86 (Morris et al, 1981). Cronbach alpha was 0.88 in this study.

Self-Efficacy: Self-efficacy was assessed via a measure built into the experimental simulation. The 2-item measure (Wood & Bailey, 1985) includes a statement that assesses the subject's confidence that they can achieve a variety of performance levels, using a rating scale 1 (no confidence) to 10 (total confidence). The scale describes different levels of production attainments, ranging from 30% better to 40% worse than standard production, and rated the extent to which they felt they could get the production team they were managing to achieve these levels of productivity, and levels in-between. Ratings were recorded prior to the second run of the simulation so that subjects would have some familiarity with the task on which they were being asked to judge their efficacy. As suggested in Wood and Bandura

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(1989) and Wood, Bandura and Bailey (1990), the strength of perceived self-efficacy was the sum of subjects' confidence scores across the described levels of production attainments.

Task-Irrelevant Thought: Sarason and Stoops (1978) developed a 23-item Cognitive Interference Questionnaire (CIQ), to assess the frequency of irrelevant cognitions occurring during a task. Sample items include, "I thought about personal worries," and are rated on a Likert scale, with anchors 1 (never) to 5 (very often). The final item represents a global report of cognitive interference, asking respondents to report the degree to which their mind wandered during the task they had just completed. The CIQ shows desirable psychometric properties. Internal consistency for the scale has been estimated at 0.91 (Pierce et al, 1998). Convergent validity has been evidenced in the scale's positive relation to test anxiety (Sarason, 1984; Blankenstein et al., 1989), both indexing negative preoccupations which undermine performance. Internal consistency in the present study was 0.90.

Ability: Ability was a baseline assessment, calculated as an average of a two-trial practice session preceding the five-trial performance measure. Internal consistency was 0.57.

Demographic Variables: Pertinent characteristics included age and gender, for control purposes. Concern for the collection of this data was a function of a number of studies suggesting that younger subjects may feel more comfortable operating computers: Nickell and Pinto (1987) found that age correlated negatively with

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computer attitudes; Kay (1990) likewise identified age as an important variable while assessing positive attitude toward computer use. Gender provides potential as an issue, given that the managerial role is stereotypically male: in all parts of the world, female senior managers are underrepresented, ranging from a high in Europe of 8%, to a low in Japan of 0.3% (Adler, 1993).

Procedure

The present study included three phases. Following provision of informed consent, participants completed questionnaires measuring negative affectivity, and state-anxiety. Upon reading the task instructions, the first measure of self-efficacy was administered. The participants then performed the complex task, a computerized managerial decision-making simulation filling furniture production orders. Each production order constituted a trial, providing endpoints at which self-efficacy and task affective reactions were gauged. Upon completion of each version, subjects completed questionnaires assessing cognitive interference, task affect, and finally, demographic variables. I thanked subjects for their participation, and then debriefed them. In addition, subjects received free refreshments for their participation, and automatically entered in a draw to win prizes.

Results

Participants

Participants in this study were 124 undergraduate students enrolled in either management (89 students) or psychology (35 students) courses during summer session at a small, liberal education university in Western Canada. Missing data reduced the final sample to 113 participants (80 from management courses and 33 from psychology). Participants were mostly female, numbering 73; 40 were male. The mean age of the group was 24.

Results

Table 1 displays descriptive statistics for all study variables, including means, standard deviations, and bivariate correlations. The data indicate relatively low to moderate scores in the self-reported measures of negative affect, state anxiety, and cognitive interference. In congruence with this, scores reflecting perceived self-efficacy and task affect were moderate to relatively high. Recorded as the number of hours taken to complete a furniture production order in the simulation, a lower score is indicative of better performance. Scores are averages over the 5-trial session for the performance measure, and over the initial 2-trial session for the baseline ability measure.

It should be noted that there was an anomaly in responses to the self-efficacy measure (Wood & Bailey, 1985), with subjects seeming to misunderstand the item.

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The scale, which assessed subjects' confidence that they could achieve production levels ranging from within 70% of standard time (i.e., perform better, taking 30% less time to complete production orders than standard), to within 140% of standard time (i.e., perform worse, taking 40% more time to complete production orders than standard). Looking over responses, it appears that some subjects (57) misunderstood the phrasing of the question, resulting in reversed responses (i.e., they had more confidence that they could achieve difficult levels of production attainments than for easier levels). However, given that the strength of perceived self-efficacy is the sum of subjects' confidence scores across the described levels of production attainments (Wood & Bandura, 1989; Wood, Bandura and Bailey, 1990), the misconstrual of the direction of levels of attainment was inconsequential to the resulting sum total.

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Table 1. Descriptive Statistics of all Study Variables									
Construct	Mean	SD	1	2	3	4	5	6	7
Negative									
1 Affectivity	2.01	0.68	0.87						
2 Anxiety	13.42	4.96	0.35**	0.88					
3 Ability	78.65	7.79	0.02	0.17	0.57				
4 Self-efficacy	57.33	16.63	-0.12	-0.16	-0.07	-			
Intrusive									
5 Thoughts	1.76	0.66	0.31**	0.35**	0.20**	-0.16	0.90		
Task									
6 Performance	75.42	12.64	0.07	0.12	0.43**	-0.14	0.37**	0.91	
7 Task Affect	2.99	0.93	-0.16	-0.03	-0.19*	0.23*	-0.44**	-0.58**	0.70
8 Gender	-	-	0.07	0.09	-0.13	-0.12	0.17	0.05	-0.11
9 Age	24.05	4.53	-0.09	-0.01	-0.09	0.01	-0.11	-0.18	0.05
N=113									

Note: scale reliabilities are shown in bold, on the diagonal.

**,< 0.01

*,< 0.05

Table 1 also contains scale reliabilities. Scale reliabilities are adequate for research purposes, ranging from 0.57 (ability) to 0.91 (task performance).

Several significant correlations emerged. Intrusive thoughts showed a significant relation with task performance ($r=0.37$, $p<0.01$), and task affect ($r=-0.44$,

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$p < 0.01$). Task performance showed the logical negative association with task affect ($r = -0.58, p < 0.01$).

Demographic variables assessed in this study included gender, age, and educational background. Neither gender nor age was related to performance ($r = 0.05, p = n.s.$, and $r = -0.18, p = n.s.$). Educational background was related to ability ($r = 0.19, p < 0.05$), but not performance ($r = 0.16, p = n.s.$). Multiple regression analysis determined whether educational background accounted for unique performance variance above and beyond the performance variance accounted for by ability. Results indicate that educational background was not related to performance after statistical control of ability $F(1, 110) = 0.93, (p = n.s.)$. Ability was used as the pertinent control for performance variance, showing a significant correlation of $r = 0.43 (p < 0.01)$.

Latent variable path analysis with partial least squares (PLS) estimation procedures tested the conceptual model presented in Figure 1. PLS is a second generation multivariate analysis technique for constructing predictive models when the constructs involved are many and highly collinear (Barclay, Higgins & Thompson, 1995). The use of PLS as an analysis technique is particularly applicable to predictive models where the emphasis is on theory development (Barclay et al, 1995); *a priori* development of a theoretical model (Figure 1) is thus a key requisite. PLS simultaneously estimates the collective effect of theoretically similar independent

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variables (such as negative affect, state anxiety, self-efficacy, and cognitive interference in this case) using principal components analysis to form latent constructs, while considering both the direct and indirect effects of multiple independent variables, using a least squares regression approach. The parameters of latent variable path models are estimated iteratively using least squares methods. PLS is advantageous to other structural equation modelling software such as LISREL in the sense that it requires neither stringent distributional assumptions, such as normality and independence of residuals, nor large sample sizes (Barclay et al, 1995). Lohmöller (1982) presents two such examples: one, a model with 27 variables was appropriately estimated with only 10 data cases, and another, with 96 indicators and 26 constructs estimated with 100 cases. Chin (1998) suggests sample size requirements are generally met by a rule of thumb of using 10 times the number of paths in the most complicated regression of the model. The requisite number of cases to meet this rule of thumb in this study is 30, so the sample size is more than adequate, based on Chin's (1998) suggestion.

PLS generates a variety of reliability and discriminant evidence that are calculated in the context of the model under investigation. Two stages are requisite for the technique: firstly, assessing the measurement model in terms of reliability and validity and secondly, assessing the structural model (Barclay et al, 1995). Following this prescribed order allows assurance that any conclusions drawn regarding the relations among constructs are based upon reliable and valid measures of the

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constructs. There is no overall goodness of fit index available in PLS. Instead, fit of the data to the model is evaluated in terms of a combination of indices: factor loadings, composite reliability, discriminant validity, average variance extracted, path coefficients, and multiple R^2 . Parameters representing measures and path relations are computed via ordinary least squares techniques.

Assessing the Structural Model

Examination of factor loadings is the first assessment of reliability. Fornell and Larcker (1981) suggest that factor loadings exceed 0.707. Problems with the structural model were found during this outer model trimming process. The majority of factors fell between 0.50 and 0.60, so the factor loadings of the hypothesized model were inadequate. This revealed multidimensionality within the scales that required revision to the measurement model for purposes of PLS analysis. Without such revision, conclusions drawn regarding relations among constructs would be based on an unstable model.

To address the need for unidimensional constructs, the anxiety measure was broken down into its subscales of worry (i.e., “I feel that I may not do as well on this task as I could”) and emotionality (i.e., “I feel panicky”). Worry was most relevant within the context of negative affect and intrusive thoughts, which might hinder performance; worriers tend to set high standards for self-evaluation and apply single failures to their whole self-concept (Flett & Blankstein, 1994). Thus, items assessing

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the worry facet became the sole reflective indicators of the anxiety construct. The cognitive interference scale was likewise comprised of two subcomponents, measuring task-related (i.e., “I thought about how much time I had left,” “I thought about how I should work more carefully”) and task-unrelated (i.e., “I thought about personal worries,” “I thought about friends”) intrusive thoughts. Preoccupation with task performance is both congruent with the personality style of negative affect individuals, and hypothesized to be a larger detriment to performance than task-unrelated mind wanderings. Distractions which are related, though not strictly relevant for task solution, would be especially difficult to block. Hasher & Zacks (1988) put forth an inhibitory cognitive theory of aging, which underscore the salience of task related cognitive interference: the elderly experience a failure of the ability to delete items from working memory that are no longer relevant to the task at hand. The subscale of task-related intrusive thoughts replaced the more general construct of intrusive cognitions.

With these structural amendments to the construct measures, the model was run in PLS as depicted in Figure 2. Using PLS analysis, the adequacy of the fit of the revised model with the data was more tenable. Table 2 shows the loadings of the items on the constructs.

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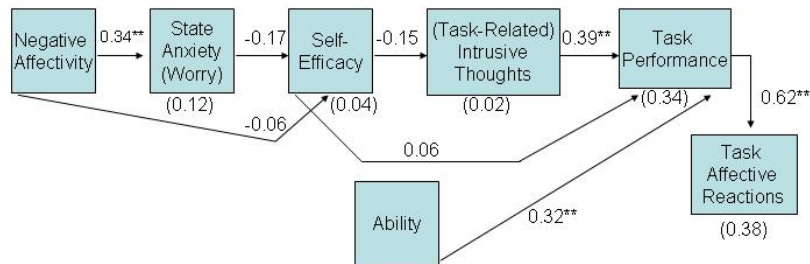


Figure 2. Revised model

Adjacent to each path in the model depicted in Figure 2, is that path's respective coefficient (direct effect), and in parentheses, the estimate of the proportion of variance (R²) in the outcome variable accounted for by the path.

Interpreting the loadings, use of less global measures was successful. Items exhibit factor loadings much more in line with Fornell and Larcker's (1981) advocated standard of 0.707 or higher, such that there is more shared variance among the construct and its respective measures than error variance (Carmines & Zeller, 1979). Deviations from this rule of thumb were not removed as there was no reason to suspect a methods effect, and revisions to the model had already ensured that the construct being measured was indeed unidimensional. Assuming the instances of low loadings were only due to noise, keeping such items increases predictive value of the

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model, adding weight by helping to minimize residual variance as long as other, more reliable indicators exist in tandem (Chin, 1998).

Table 2. Factor loadings and Internal Consistency of Items

Construct and Items	Factor loading	Composite Scale Reliability	Average Variance Extracted
Negative Affectivity		0.89	0.46
NAQ1	0.67		
NAQ2	0.73		
NAQ3	0.74		
NAQ4	0.69		
NAQ5	0.72		
NAQ6	0.71		
NAQ7	0.65		
NAQ8	0.56		
NAQ9	0.69		
NAQ10	0.58		
Anxiety		0.87	0.57
A1	0.49		
A2	0.74		
A3	0.71		
A4	0.89		
A5	0.88		
Ability		0.83	0.71
A1	0.84		
A2	0.84		
Self-efficacy	1.00	1.00	1.00
Task-related Intrusive Thoughts		0.89	0.45
IT2.1	0.77		
IT2.2	0.62		
IT2.3	0.67		
IT2.4	0.54		
IT2.5	0.61		
IT2.6	0.79		
IT2.7	0.62		
IT2.8	0.56		
IT2.9	0.78		
IT2.10	0.70		

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Table 2. (cont.)

Construct and Items	Factor loading	Composite Scale Reliability	Average Variance Extracted
Task Performance		0.94	0.76
P1	0.78		
P2	0.88		
P3	0.91		
P4	0.91		
P5	0.88		
Task Affect 2		0.90	0.65
TA2.1	0.87		
TA2.2	0.82		
TA2.3	0.89		
TA2.4	0.72		
TA2.5	0.71		

Internal consistency in a PLS analysis is assessed via the calculation of a composite reliability score (Fornell & Larcker, 1981). Composite reliabilities are similar to Cronbach’s alpha reliabilities; however, composite reliabilities use item loadings generated within the causal model to estimate internal consistency, and are not subject to the same inflation bias (i.e., not influenced by the number of items in a scale) as is Cronbach’s alpha. Table 2 presents all composite reliabilities of the scales used in this study, which range from 0.83 (ability) to 0.94 (task performance). Because constructs defined by a single manifest indicator are considered to have perfect measurement, for self-efficacy, which was a summated measure, the loadings, composite reliability and average variance extracted is necessarily designated as 1.00.

The mean communality coefficient (h^2) indicates the strength of the measurement model by calculating the degree to which a structural (inner) model

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adequately represents each of the manifest variables in the outer model. Falk and Miller (1992) contend that a value above 0.50 signifies a good fit of the model to the data. The mean communality for the model presented in Figure 2 is 0.53.

Fornell and Larcker's (1981) measure of average variance extracted captures the amount of variance a latent variable derives from its indicators, relative to measurement error, recommending a criterion of 0.50 or higher. All AVEs of variables approximate this recommended level, thus indicating the constructs in the model had fair convergent evidence (i.e. indicators had adequate loadings with their respective latent variables).

The R^2 value for the endogenous constructs is a measure of the predictive power of the model, indicating the amount of variance in the constructs explained by the model. The mean R^2 for the endogenous variables in the model is 0.13; the model possesses a predictive relevance of 13%. Note that this includes variance accounted for in predictors that are not related, and thereby warrants cautionary interpretation, because a high value can relate even when little criterion variance is accounted for.

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Table 3. Discriminant Evidence of Latent Variables in Substantive Model

Construct	1	2	3	4	5	6	7
Negative							
1 Affectivity	0.68						
2 Anxiety	0.34**	0.75					
3 Ability	-0.03	0.21*	0.84				
4 Self-Efficacy	-0.12	-0.19*	-0.08	1.00			
Task-Related							
5 Intrusive Thoughts	0.22*	0.37**	0.29**	-0.15	0.67		
6 Task Performance	0.06	0.14	0.44**	-0.14	0.49**	0.87	
7 Task Affect	-0.13	-0.04	-0.21*	0.21*	-0.51**	-0.62**	0.81

**.< 0.01 *.<0.05

Diagonal elements are correlations of each construct with its measures.

Off-diagonal elements are correlations between constructs.

The value of R^2 is of particular interest is the value for task performance because it suggests how well the explanatory constructs account for the latent variable. The larger the variance on the criterion latent variable, the greater the likely explanatory power of the model. The R^2 for task performance is 0.34, indicating that the latent variables in the model explain 34% of the variance in performance.

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Table 3 shows relations among the latent constructs. Correlations of each construct with its items are shown bolded, on the diagonal, and calculated as square roots of the average variance extracted. Off-diagonal elements are correlations between the constructs. For adequate discriminant evidence, Fornell and Larcker (1981) advocate that the diagonal elements be greater than the entries in the corresponding rows and columns, thus a construct loads more highly on itself than any other measure. Table 3 reveals that the latent variables do indeed meet this criterion; the measures show both inherent convergence, and are tapping constructs distinct from other measures in the model.

Assessing the Conceptual Model

Table 3 presents the bivariate correlations among the latent constructs. These correlations are somewhat different than those shown in Table 1, as a result of selecting sub-scales to reflect unidimensional constructs, and the simultaneous iteration procedures of estimations in PLS. Several patterns of association emerged. Negative affect is related to anxiety ($r=0.34$, $p<0.01$), and task-related intrusive thoughts ($r=0.22$, $p<0.05$). Negative affect showed no association with self-efficacy ($r=-.12$, n.s.), task affect ($r=-0.13$, n.s.), and task performance ($r=0.06$, n.s.) Anxiety was related to task-related intrusive thoughts ($r=0.37$, $p<0.01$), ability ($r=0.21$, $p<0.01$), and self-efficacy ($r=-0.19$, $p<0.05$); however it was neither related to task performance ($r=0.14$, n.s.), nor the other study variables. Self-efficacy was not

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related to either reported task-related intrusive thoughts ($r=-0.15$, n.s.), or task performance ($r=-0.14$, n.s.); but, it was related to task affect ($r=0.21$, $p<0.05$).

Task-related intrusive thoughts were significantly associated with all variables except self-efficacy. Those reporting a greater frequency of task-related intrusive thoughts performed poorer on the task ($r=0.49$, $p<0.01$); a lower score indexed a better performance, hence the positive association). Cognitive interference was also related to task affect ($r=-0.51$, $p<0.01$). Those reporting higher cognitive interference expressed more negative task reactions. Task performance was related to task affect ($r=-0.62$, $p<0.01$).

Figure 2 and Table 4 summarize the path relations in the conceptual model. As can be seen, the paths from task-relevant intrusive thoughts are significant and substantive. In particular, intrusive thoughts related to task performance ($\beta=0.39$, $p<0.05$), and indirectly to task affect ($\beta=-0.24$, $p<0.05$). Thus, the greater the self-reported intrusive thoughts, the lesser the performance, leading to less positive reactions to the task ($\beta=0.62$, $p<0.05$).

Negative affect was related to anxiety ($\beta=0.34$, $p<0.05$), and the construct's total effect (indirect plus direct effects) on self-efficacy was $\beta=-0.12$ (n.s.). Overall, non-significance of results led to the rejection of the majority of the five hypotheses; Table 4 presents tests of Hypotheses 1 through 4, (H_1 and H_2 are based upon indirect effects, H_3 is a direct effect, and H_4 is the total effect of both indirect and direct

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effects). PLS analysis of the model supported only hypothesis 3, which predicted negative affect's positive linkage to intrusive thoughts. There was no support for H₅, which proposed self-efficacy as a mediator in the predicted inverse negative affect-performance relation (H4).

Table 4. Tests of Hypotheses through Conceptual Model

Hypothesis	Proposed Relation	Actual Relation
1 negative affect -> task performance	(-)	0.06
2 negative affect -> task affect	(-)	-0.13
3 negative affect -> intrusive thoughts	(+)	0.22*
4 self-efficacy -> task performance	(-)	-0.11

*. < 0.05

Discussion

Interpretation of Results

The present study examined the relative contributions of negative affectivity, state anxiety, self-efficacy and cognitive interference as predictors of task performance and affect. The hypothesized model proposed a series of linkages, whereby negative affect would predispose individuals to an increased state of anxiety (worry), triggering a lowered sense of self-efficacy which would increase susceptibility to (task-related) intrusive thoughts, resulting in diminished task performance and affect. On the whole, the findings of this study provide limited support for the model.

As expected, negative affectivity showed a significant tie to anxiety. This concurs with previous findings. Watson & Clark's (1984) factor analysis reported that measures of negative affect tend to correlate in the 0.40s with situation-specific tests of anxiety (i.e., Sarason's 1978 Test Anxiety Scale), and around 0.60 with the State-Trait Anxiety Inventory A-State Scale (Spielberger, Gorsuch, & Lushene, 1970). Such findings echo Bolger & Zuckerman's (1995) contention that highly negative affect individuals show heightened experience of and reactivity to stressful events.

Cognitive interference played a key role in correlations among constructs. Specifically, task-related intrusive thoughts proved a hindrance to both performance and favourable reactions to the task (an indirect effect). Findings by Hasher and Zacks (1988) support the import of task-related intrusive thoughts. The authors posit an inhibitory theory of cognitive aging, whereby the elderly experience a failure of the

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ability to delete items from working memory that are no longer relevant to the task at hand. This underscores the idea that blocking distractions is especially difficult when they seem relevant to the task. The tendency is to dwell on these intrusions (such as time left to complete the task), which, while related to the task, are not strictly relevant to the solution. This is akin to the assumption of Tallis and Eysenck (1994), that non-productive persistence in problem-solving is mediated by an inability to disengage from tasks, and an inability to distinguish between solvable and un-solvable problems. The authors found that in a timed-limited setting, worriers were slower to disengage from insoluble tasks than non-worriers, thereby reducing their performance. The interfering effects of anxiety essentially diminish worrier's attentional resources. This is also in accordance with Kanfer & Heggstad's (1997) resource allocation model, whereby task-unrelated thoughts provide competition for cognitive resources, retention of which is necessary for successful task performance.

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Data also support the intuitive link between task performance and task affective reactions. Those who performed better reported more favourable reactions toward the task. This is consistent with previous findings in salesperson motivation; that performance shows a positive relation to positive outcome emotions (Brown, Cron, & Slocum, 1997).

Hypothesis 3 proposed that negative affect was positively related to cognitive interference. The two variables were correlated ($r=0.22$, $p<0.05$), indicating that

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higher negative affect individuals are indeed more vulnerable to influences on the root of their core tendencies: intrusive thoughts.

Negative affect showed a significant tie to anxiety, but neither of the constructs was linked to self-efficacy. Such a finding is in contrast to the hypothesized model, as well as much literature postulating that both negative affect and anxiety are inversely related to self-efficacy (e.g., Bandura, 1997). This may have been due to the relatively small sample size. Another possible explanation for the missing link between negative affect and self-efficacy is derived from research which suggests that depressed people may actually be more accurate in their judgements than their non-depressed counterparts, an effect known as depressive realism (Alloy & Ahrens, 1997). Thus, while high negative affect individuals do not tend to over-estimate their abilities, they may not under-estimate them either. To the extent that ability is relatively important and a less variable determinant of performance, the potential role for negative affect in efficacy formation may be compromised.

Self-efficacy was not predictive of task performance. This discrepancy among self-efficacy findings warrants further discussion, as it contradicts much of the literature on self-efficacy (Bandura, 1997). An important consideration is that the self-efficacy measure was largely a response to the novelty of the task. Gist and Mitchell (1992) have noted the difficulty in assessing self-efficacy accurately for novel tasks; Kanfer (1991) likewise found that the less experience subjects have with a task,

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the less accurate their prediction of performance. Subjects in this study had no prior experience in the task, and were thus less accurate in their efficacy assessments.

A further impediment to accurate self-efficacy assessment was the complex nature of the task. Complex tasks require subjects to approximate numerous skill and motivational parameters; the intricacy of this activity may increase the error of assessment (Gist & Mitchell 1992). Self-efficacy for complex tasks functions more on the enactive mastery source of the construct (Bandura, 1997). Self-efficacy perceptions are more accurate as one becomes better acquainted with the task on which the capability judgements are based, hence a later administration would be a more accurate relevant measure. Gist and Mitchell (1992), and Wood and Bandura (1989) have evidenced that task complexity moderates the efficacy-performance relation of complex tasks; a meta-analysis by Stajkovic and Luthans (1998) likewise supported this finding that the relation between self-efficacy and performance tends to be weaker for higher levels of task complexity. In addition, Bandura (1997) offers an alternate explanation, that this limitation is due more to the limited scope of self-efficacy measures for complex tasks (i.e., the complex task's multi-faceted nature is at odds with an ability judgement assessed using a single-faceted efficacy measure), not because of an actual lacking relation between the two variables.

Despite these possibilities in accounting for non-significant findings of self-efficacy, it remains that a large body of work has documented the inverse efficacy-

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performance relation (e.g., Bandura, 1997). Moreover, studies using both this particular efficacy scale and complex task reported significant relations (Wood, Bandura, & Bailey, 1990; Wood & Bandura, 1989). As noted earlier, relations between efficacy and performance strengthened as subjects gained familiarity with the task. The studies differed methodologically from the present research, gauging performance in a succession of 4 blocks, comprised of 4 trials each; as opposed to 2 blocks, comprised of a 2-trial, then a 5-trial session. The efficacy measure, administered after the 2-trial block may not have given subjects time enough to familiarize themselves with the skills requisite to successfully execute the task. Without subjects fully cognizant of the demands placed upon them, their capability judgements may have been more general self-efficacy formations, rather than task specific assessments. This is in keeping with some other research, which shows that general self-efficacy is a poor predictor of performance (Stanley & Murphy, 1997).

Most surprising is that negative affect was not the detriment to performance as had been found in previous studies (e.g., a meta-analysis by Barrick & Mount, 1991; solving anagrams in Erez & Judge, 2001). However, other researchers have also failed to establish a significant relation between negative affect and performance (Wright, Larwood, and Denney, 2002). A possibility for the lacking relation between negative affect and performance can be drawn from research focusing on defensive pessimism (Showers, 1992). Defensive pessimists typically enter new achievement contexts with unrealistically low expectations, despite acknowledging a history of past successes.

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Their cognitions are counter-intuitive, in that while low expectations generally exert a self-fulfilling prophecy effect upon subsequent performance, they are inconsequential for defensive pessimists. Also, while high anxiety usually inhibits performance, defensive pessimists employ their anxiety as motivation. In effect, they acknowledge both their negativity and apprehensions, and endeavour through them (Norem & Illingworth, 1993).

As explained by the strategy of defensive pessimism, anxiety was not related to task performance, while cognitive interference was. Taken together, these findings emphasize the fact that while anxiety and intrusive thoughts share similar aspects they are also distinct constructs.

Contributions, Limitation, and Future Directions

A key strength of the present study lies in the use of validated measures of personality and individual differences, as well as the complex managerial decision-making simulation. In addition, use of only specific subscales narrowed the focus to a precise delineation of the processes involved.

However, the proposed model is not intended to be exhaustive. For example, varying the order of state anxiety and self-efficacy could produce different findings. As efficacy is partially based upon past successes and failures (enactive mastery; Bandura, 1997), a goal for future research would be to examine whether feelings of self-efficacy elicit state anxiety (and then cognitive interference), rather than the

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reverse order found in this model. In addition, subsequent efficacy formations (i.e. post-task) are likely to be more related to task performance, as modeled in Wood & Bandura (1989), so, extending investigation of this feedback loop over a greater number of performance blocks would be of interest.. Inclusion of other variables, such as need for achievement (McClelland, Atkinson, Clark & Lowell, 1953) could provide additional complexity and insight.

While PLS analysis was advantageous for this study, robust enough to handle the small sample size, it proved to be somewhat of a hindrance in terms of rejecting the multi-dimensional scales used in the study. Incorporating both scales of task-related and task-unrelated intrusive thoughts into the model would provide a valued comparison to the results of this study.

The highlight of this study was the role played by intrusive thoughts, suggesting that much future research should be aimed at investigating this construct, and its implications beyond educational settings. In addition to focusing on predispositions to intrusive thoughts, it would be wise to utilize alternate measures to assess these thoughts. For instance, the task-related scale of the Cognitive Interference Questionnaire (Sarason & Stoops, 1978) used in this study captures primarily negative, self-focused concerns about performance; thoughts of a less deprecatory nature may also compromise performance. Future work would benefit from deriving self-report ratings of intrusive thoughts whilst subjects perform the task (rather than the retrospective method used in this study), although this may

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complicate performance. Retrospective measures run the risk that participants forget thoughts, or if they performed particularly well, this success could overshadow the memory of any self-doubts experienced during task performance. Moreover, researchers should consider the use of thought listing procedures, which would serve to break the boundaries of forced choice responses, magnifying insight into the nature of cognitive interference.

Implications for Practitioners

The results of this study provide evidence that interference from on-task intrusive thoughts and cognitions pertaining to a complex task result in reduced performance. Given that organizational settings routinely demand sustained attention to complex tasks and the formulation of effective task strategies (Smith, Ford, & Kozlowski, 1997), opportunities to intervene and enhance employee task focus such that there is less focus on personal deficiencies and possible adverse task outcomes is invaluable.

Fortunately, as Kanfer and Ackerman (1996) point out direction of attentional resources is a malleable ability; that is, one can be trained to remain task-diagnostic, rather than self-diagnostic. Their study therefore holds implications that can be adopted by practicing managers. Indeed, Sarason (1984) demonstrated that attention-directing instructions improved exam performance and decreased the amount of cognitive interference in participants who displayed a tendency towards entertaining task irrelevant thoughts. Thus, managers may provide programs

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designed to enhance employee attentional focus to the task at hand. Measures of individual differences such as negative affect and anxiety could serve as a diagnostic tool, identifying those with the greatest vulnerabilities to intrusive thoughts. Such predisposed individuals would benefit from training to guard against attentional diversions. Employees' improved performance of complex tasks would increase organizational efficiency, to be actualized as gains in profitability.

Conclusion

Investigating the linkages between negative affect and state anxiety, thought to lower self-efficacy and increase cognitive interference, to ultimately reduce task performance and affect, findings indicate that the cognitive interference plays a key (and detrimental) role. Negative affect and worry were, in fact, unrelated to task performance. It is then the cognitive consequences of an affective state, as distinct from the affective state itself, which impacts performance. Clearly then, close attention to cognitive variables is important, especially in those situations where performance is impaired.

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Appendix A: Negative Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to the word. Indicate to what extent you generally feel this way, that is, how you feel on the average.

(1=Very Slightly or Not at all, 2=A little, 3=Moderately, 4=Quite a bit, 5=Extremely)

Distressed.

Upset.

Guilty.

Scared.

Hostile.

Irritable.

Ashamed.

Nervous.

Jittery.

Afraid.

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Appendix B: State Anxiety (Worry Subscale)

To each of the following statements, please use the scale provided to indicate your feelings, attitudes, or thoughts as they are right now in relation to this task.

(1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree)

I feel regretful

I have an uneasy, upset feeling.

I feel that others will be disappointed in me.

I feel that I may not do as well on this task as I could.

I do not feel very confident about my performance on this task.

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Appendix C: Self-Efficacy Scale

In the “Can do” column below answer yes if you feel that you have the ability, knowledge of the game, and characteristics of the manager necessary to have your department achieve the level of performance indicated in the next 3 months (i.e. 12 decision cycles). Answer no if you feel you will not achieve the indicated level of performance. For performance levels to which you answer yes, indicate how confident you are of achieving that level of performance in the adjacent column, using a scale from 0 to 9, with 0=total lack of confidence and 9=total confidence.

140% of estimated time.

120% of estimated time.

110% of estimated time.

105% of estimated time.

Estimated time.

95% of estimated time.

90% of estimated time.

80% of estimated time.

70% of estimated time.

Appendix D: Task-Related Intrusive Thoughts Scale

This questionnaire concerns the kinds of thoughts that go through people's heads at particular times, for example, while they are working on a task. The following is a list of thoughts, some of which you might have had while doing the task on which you have just worked. Please indicate approximately how often each thought occurred to you while working on it by circling the most appropriate number on beside each statement.

(1=Never, 2=Once, 3=A few times, 4=Often, 5=Very often)

I thought about how poorly I was doing.

I thought about what the experimenter would think of me.

I thought about how I should work more carefully.

I thought about how much time I had left.

I thought about how others have done on this task.

I thought about the difficulty of the experiment.

I thought about my level of ability.

I thought about the purpose of the experiment.

I thought about how often I got confused.

I thought about how I would feel if I were told how I performed.

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Appendix E: Task Affect Scale

The following statements refer to your reactions to the task you have just completed. Please circle the number on the scale which best describes your feelings toward the task.

(1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree)

I was satisfied with my overall performance on this task.

I enjoyed participating in this task.

I think I am pretty good at this task.

I put a lot of effort into this task.

I found this task to be a useful experience.