



Struggling to Meet the Bar: Occupational Progress Failure and Informal Leadership Behavior

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Abstract:	<p>We integrate theory and research about individuals' responses to failures to develop a model in which occupational progress failures precipitate ruminative processes that limit the extent individuals subsequently act as informal leaders. Our first study, an experiment with a sample of advanced accounting students, found that manipulating poor performance on a simulated certification test promoted ruminative thoughts about the test, which were negatively related to peer ratings of informal leadership behavior during a subsequent task. A separate field study using a regression discontinuity design in a 14-week military training program found that failure to pass the required physical fitness examination early in group formation influenced psychosomatic symptoms, an indirect measure of sustained rumination, and consequently hindered enactment of informal leadership behavior. We also theorized and found that neuroticism enhanced the positive effect of failure on rumination in Study 1 and psychosomatic symptoms in Study 2. We discuss the implications for developing theories concerning how disruptive personal events may interfere with employees' engaging in informal leadership behavior.</p>

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6 **Struggling to Meet the Bar:**
7 **Occupational Progress Failure and**
8 **Informal Leadership Behavior**
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11
12 **John M. Schaubroeck**
13 University of Missouri
14 jschaubroeck@missouri.edu
15
16

17 **Ann C. Peng**
18 University of Missouri
19 cpeng@missouri.edu
20
21

22 **Sean T. Hannah**
23 Wake Forest University
24 hannahst@wfu.edu
25
26

27 **Jingjing Ma**
28 The Hong Kong University of Science and Technology
29 maj@ust.hk
30

31 **Anna M. Cianci**
32 Wake Forest University
33 cianciam@wfu.edu
34
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STRUGGLING TO MEET THE BAR: OCCUPATIONAL PROGRESS FAILURE AND INFORMAL LEADERSHIP BEHAVIOR

ABSTRACT

We integrate theory and research about individuals' responses to failures to develop a model in which occupational progress failures precipitate ruminative processes that limit the extent individuals subsequently act as informal leaders. Our first study, an experiment with a sample of advanced accounting students, found that manipulating poor performance on a simulated certification test promoted ruminative thoughts about the test, which were negatively related to peer ratings of informal leadership behavior during a subsequent task. A separate field study using a regression discontinuity design in a 14-week military training program found that failure to pass the required physical fitness examination early in group formation influenced psychosomatic symptoms, an indirect measure of sustained rumination, and consequently hindered enactment of informal leadership behavior. We also theorized and found that neuroticism enhanced the positive effect of failure on rumination in Study 1 and psychosomatic symptoms in Study 2. We discuss the implications for developing theories concerning how disruptive personal events may interfere with employees' engaging in informal leadership behavior.

Due to heightened demands for innovation and adaptation, organizations increasingly need employees to take more initiative and exhibit leadership among peers, even when leadership is not a part of their formal job requirements (Day, Gronn, & Salas, 2004; Klein, Mahoney, McGahan, & Pitelis, 2019). This has encouraged scholars to examine factors that may prompt individuals who are not in formal leadership roles to behave as leaders among their work unit peers. Yet, this research largely overlooks the influences of situational factors, and therefore presents an incomplete picture of when and why individuals practice informal leadership. Informal leadership "occurs when team members who do not occupy formal leadership positions engage in influence behavior that helps their team determine shared goals, motivates task activity in pursuit of those goals, and creates a positive social climate" (Wellman et al., 2019: 337). Drawing on a growing recognition of the important role that events can have on behavior in groups and organizations (Morgeson, Mitchell, & Liu, 2015), we theorize that experiencing

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3 failed progress toward achieving a desired occupational benchmark precipitates psychological
4 responses that can limit individuals' capabilities to engage in informal leadership behaviors.
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8 Feedback concerning failed progress toward achieving one's occupational benchmarks is
9 ubiquitous, and it is normally a matter of great personal concern (Brunstein & Gollwitzer, 1996).
10 For example, members of financial, insurance, law enforcement, military, civil engineering,
11 medical, firefighting, commercial aviation, academics, real estate, legal, and many other
12 professions must pass rigorous examinations to ensure their continued employment or
13 advancement within their profession. Research has also shown that failures in pursuing career
14 goals that do not involve tests, such as project discontinuance (Shepherd, Patzelt, & Wolfe,
15 2011), rejections for promotion (Lam & Schaubroeck, 2000), and perceiving one is failing to
16 achieve career benchmarks (Creed, Wamelink, & Hu, 2015) can be a mentally and emotionally
17 consuming concern. When important personal goals are unattained, the failure remains active in
18 one's mind, particularly when one can later reverse the failure (LeRoy, 2009; Martin & Tesser,
19 1989). We refer to evidence of a discrepancy between expected and actual occupational progress,
20 but which is potentially reversible through one's own efforts, as *occupational progress failure*.
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37 We draw from two perspectives to model how occupational progress failure impedes
38 informal leadership behavior. First, the goal progress theory of rumination (Martin & Tesser,
39 1989) states that when individuals fail in domains that are important to their personal identities
40 they tend to ruminate about the failure and its implications for themselves until they reverse the
41 failure or the failure becomes terminal. Rumination is "a form of emotion-focused thinking in
42 which one devotes considerable attention to setbacks or regrets and, thus, withholds cognitive
43 resources from more productive applications" (Dane, 2018: 186-7). Further drawing from the
44 goal progress theory, we argue that more neurotic individuals will demonstrate stronger effects
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3 of occupational progress failure on self-focused rumination and, separately, psychosomatic
4 symptoms that derive from prolonged rumination (Brosschot, Gerin, & Thayer 2006).
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8 Second, Kanfer and Ackerman's (1989) resource allocation model argues that performance
9 and learning on novel or complex tasks is compromised by the more limited attentional resources
10 available when there are other tasks or thoughts that prompt one's attention. Informal leadership
11 requires considerable attention to identifying the needs of others, anticipating change in the
12 environment to foster collective adaptation, and determining how to best exert social influence
13 (Day et al., 2004; Gerpott, Lehmann-Willenbrock, Voelpel, & van Vugt, 2019; Reiter-Palmon,
14 2003; Zaccaro, Gilbert, Thor, & Mumford, 1991). Informal leadership behaviors are complex
15 and not routinized (Lord, Hannah, & Jennings, 2011), thus requiring surplus attentional resources
16 beyond those required for core tasks (see Mikulincer, 1989). Persistent rumination elicited by
17 occupational progress failures may therefore reduce informal leadership behaviors by limiting
18 surplus attentional resources. We thus formulate a moderated mediation model that jointly links
19 occupational progress failure and trait neuroticism to informal leadership behavior.
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35 We tested our model in two separate studies. The first study was an experiment that
36 manipulated failure on a practice run of the CPA exam that student accountants need to pass to
37 advance their careers in public accounting. This study examined the mediated effect of failure
38 through ruminative thinking on informal leadership behavior as exhibited in a subsequent
39 leaderless group discussion task. The second study assessed the relationship between
40 occupational progress failure and informal leadership as exhibited over a 14-week period in a
41 cohort of military trainees. Using a regression discontinuity design, we tested a causal model in
42 which failure on a diagnostic physical fitness test, which trainees needed to subsequently pass to
43 proceed with their military careers, was indirectly related to peer-rated informal leadership
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3 behavior through elevated psychosomatic symptoms. In both studies, we further examined how
4 neuroticism moderates the indirect effect of failure on informal leadership behavior.
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8 Our research contributes to the leadership literature primarily in two ways. The first
9 contribution lies in illuminating how occupational progress failure events can contribute to
10 individuals' propensities to demonstrate leader-like behaviors among their peers. Occupational
11 progress failures are prevalent in organizational life. They maintain their disruptive effects on
12 attention and behavior because a cycle of rumination is unlikely to terminate until either success
13 or irreversible failure occurs (Jones, Papadakis, Orr, & Strauman, 2013; Roberts, Watkins, &
14 Wills, 2013). By theorizing how occupational progress failure events can have enduring effects
15 on informal leadership behavior, over and beyond other established individual characteristics
16 (including extraversion, conscientiousness, and neuroticism) and interpersonal factors (peer
17 respect and interpersonal justice), and by modeling how these events interact with trait
18 neuroticism, our studies reveal the powerful yet largely neglected role of events in leadership.
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33 This research also describes how intrapsychic states compromise employees' potential to
34 engage in informal leadership behavior. Leadership is not just 'granted' by others. It must first be
35 'claimed' by the individual through concerted attempts to enact leadership (DeRue & Ashford,
36 2010). Complementing the extant psychological perspectives, and consistent with the resource
37 allocation model (Kanfer & Ackerman, 1989), our research indicates that occupational progress
38 failure limits acts to claim informal leadership, and this occurs through the intra-psychic process
39 of ruminative cognitions (Study 1) and the psychosomatic symptoms that are precipitated by
40 persistent rumination (Study 2; see Ottaviani et al., 2016; Verkuil, Brosschot, Gebhardt, &
41 Thayer, 2010). Thus, we extend theory and research on informal leadership by focusing on the
42 cognitions of would-be peer leaders, promoting a new avenue for leadership research. The
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3 increasingly competitive occupational landscape and the growing demand for occupational
4 incumbents to pass certification tests (Albert, 2015) and take on high-risk assignments (Dong,
5 Seo, & Bartol, 2014), together with the heightened importance of informal leadership behavior in
6 today's complex and turbulent work environments, lend practical urgency to such understanding.
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12 **FAILURE EVENTS, COMPROMISED ATTENTION, AND INFORMAL LEADERSHIP**

14 As reviewed by Morgeson and colleagues (2015), a broad range of studies point to how
15 particular events can be disruptive to the routines and adaptive behaviors of individuals and other
16 entities. They noted that events are critical when they have potential to "curtail the attainment of
17 important goals" and they "become a central focus until they are resolved" (2015: 521). As noted
18 above, occupational progress failures are critical to the lives and careers of incumbents and thus
19 tend to provoke considerable rumination about oneself and the implications of the failure (Martin
20 & Tesser, 1989). Such self-focused rumination about failure (or "ruminative thinking," hereafter)
21 uses cognitive resources that could otherwise be used for non-core tasks such as engaging in
22 informal leadership behaviors. Below we describe how occupational progress failures induce
23 cognitive states that limit individuals' capacities to meet the challenges of informal leadership,
24 and we conceptualize how responses to these events may be contingent on individual differences.
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39 **Occupational Progress Failure and Ruminative Thinking**

41 The goal progress theory of rumination (Jones et al., 2013; Martin & Tesser, 1989) focuses
42 on goal progress failure events and how these promote ruminative thinking. Goal progress
43 failures are personally "important" and stall one's progress toward a "higher-order" goal (Martin
44 & Tesser, 1989: 308-309). They are not terminal events like losing one's position or suffering
45 failure of one's marriage. Goal progress theory draws from the Zeigarnik effect wherein
46 incomplete tasks are more accessible in memory than completed tasks. Martin, Shrira, and
47 Startup (2004) provide the example of individuals who have the higher-order goal of receiving
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3 academic tenure. Falling short of an acceptable publication trajectory at the time of mid-term
4 review would be an example of a goal progress failure, as the individual can potentially reverse
5 this trend by the time of the tenure decision. Occupational progress failures are a subtype of goal
6 progress failures; they have implications for career advancement, a higher-order goal that is
7 prominent for most people (Creed et al., 2015).
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15 When people do not attain an important personal benchmark, they tend to dwell on the
16 failure and their need to accomplish the goal (LeRoy, 2009). As stated by Martin and Tesser,
17 rumination “is instigated when individuals fail to progress toward important higher order goals
18 and ceases when individuals either attain the goal, resume progress toward it, or disengage from
19 the goal” (2006: 147). Failure-related thoughts that derive from incomplete progress toward a
20 higher-level goal recur continually, which is a defining feature of ruminative thinking.
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Individuals who fail initially to achieve an important occupational benchmark but have the opportunity to subsequently reverse such failure are prone to ruminative thinking because they cannot disengage from the failed goal. For example, analysts in U.S. brokerage firms who fail their Security and Exchange Commission Series 7 exam cannot advance to a brokerage sales position. They may retake the exam at a later date. In the meantime, the failure, how that failure is perceived by others, and the potential for the failure to derail one’s career are salient concerns. Therefore, occupational progress failures precipitate self-focused rumination (“ruminative thinking,” hereafter), a pattern of repetitive, uncontrolled thoughts about the failure and its implications for oneself (see Jones et al., 2013; Martin & Tesser, 1989).

The effects of goal progress failures on ruminative thinking have been demonstrated in laboratory studies (e.g., Geisler & Kubiak, 2009; Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999; Roberts et al., 2013; Thompson, Webber, & Montgomery, 2002) and field

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3 studies of individuals' self-reports of goal failures and rumination (Lavalley & Campbell, 1995;
4 Moberly & Watkins, 2010). This review of extant theory and research leads to our first
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7 hypothesis:

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10 *Hypothesis 1: Occupational progress failure is positively related to ruminative thinking.*

11 12 **Indirect Effects of Occupational Progress Failure on Informal Leadership Behavior**

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14 Theories of cognitive resource allocation emphasize that while individuals differ in the
15
16 overall amounts of cognitive resources that they can devote to different tasks, each has a finite
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18 amount of resources. Individuals are less able to engage effectively with tasks when their
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20 attention is occupied by concerns about other matters (Kahneman, 1973). Kanfer and
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22 Ackerman's (1989) resource allocation model has been particularly influential in guiding
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24 research about performance, motivation, and learning. Their model distinguishes domains of
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26 attention into on-task, off-task, and self-regulatory effort. On-task effort refers to attention
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28 devoted to performing a task, whereas off-task effort concerns thoughts and actions that distract
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30 from performing a task, such as daydreaming or ruminating about matters unrelated to the task.
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32 Self-regulatory resources, such as self-monitoring to ensure one's actions are correctly adapted
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34 to the task, evaluating one's progress, or managing one's affective reactions, also use attentional
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36 resources, and these determine how one distributes effort across on-task and off-task domains.
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42 The resource allocation model also proposes that the amount of attentional resources
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44 needed to effectively perform a task increases when the task is more complex and less well-
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46 learned. To lead, whether formally or informally, one must actively process informational cues
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48 from the social and external environment to determine when adaptive responses are needed from
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50 the group and how one can support others. At the same time, one must identify interventions that
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52 may benefit the maintenance or collective performance of the group and determine how best to
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54 engage social influence tactics to gain cooperation for one's initiatives (Day et al., 2004; Gerpott
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3 et al., 2019; Reiter-Palmon, 2003; Zaccaro et al., 1991). Owing to the many external cues and
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5 other novel information one must process to engage in informal (and formal) leadership,
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7 leadership is regarded as a complex task domain (Lord et al., 2011). This suggests that
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9 performing complex and novel tasks such as informal leadership requires greater attentional
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11 resources than routine and well-learned tasks (e.g., core job tasks).
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15 Unlike formal leadership, for which incumbents have typically gained experience leading
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17 and leadership demands are continual, informal leadership is by definition discretionary and
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19 comparatively less routine. After applying their cognitive resources to core tasks, in general
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21 individuals have less to allocate toward the complex task of informal leadership. When this
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23 limited pool of cognitive resources is further compromised by attending to off-task demands,
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25 such as by ruminating about an occupational progress failure, one's attentional resources may be
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27 reduced to such a low level as to preclude effective informal leadership behaviors. Consider the
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29 example of the stock trader ruminating over the failed exam described above. When meeting
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31 with peers to select a stock portfolio (primary core task), with the off-task ruminative thoughts
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33 about failure consuming attention, they would have less resources to allocate beyond the primary
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35 purpose of the meeting (portfolio selection). They would thus be less likely to engage in informal
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37 leadership behaviors in their team, such as by monitoring and managing the team's emotional
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39 tone and interpersonal interactions and considering how the team might better coordinate its
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41 expertise.
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47 In sum, occupational progress failure results in attentional resources being allocated to the
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49 off-task activity of failure-related rumination. The constraint on resources imposed by significant
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51 off-task efforts forces individuals to make trade-offs between different on-task activities as well
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53 as between the on-task domain and self-regulatory effort (Kanfer & Ackerman, 1989). Thus,
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3 following an occupational progress failure, individuals are less likely to devote cognitive
4 resources to non-core (discretionary), complex tasks like informal leadership. Leading others
5 effectively also requires high self-regulatory effort and capability (Zhou, Wang, & Vancouver,
6 2019), which is impaired by ruminative thoughts (Schwartzler, 1996). The need to devote
7 attentional resources to self-regulation competes with the broader need for attentional resources
8 to perform informal leadership. Therefore, the demands for self-regulation inherent in informal
9 leadership exacerbate the extent to which ruminative thinking following an occupational
10 progress failure limits the capacity to enact such behaviors. In contrast, core tasks are well-
11 learned and require fewer attentional resources to perform effectively. Thus, even when off-task
12 rumination leaves fewer attentional resources available for a core task (e.g., stock picking in
13 example above) and self-regulation, performance on that task is less likely to be compromised
14 than would informal leadership behavior.

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17 Our prediction that informal leadership will be hindered when cognitive resources are less
18 available due to ruminative thinking is also consistent with the finding of dual-task studies
19 involving failure feedback. Performance on complex tasks is particularly impaired after
20 individuals have received failure feedback on an alternate task (Mikulincer, 1989; Whiteman &
21 Mangels, 2016). This effect is attributed to the processes outlined in resource allocation theory
22 wherein the failure increases ruminative thinking, diminishing the attentional resources needed to
23 engage complex tasks effectively. Notably, complex tasks often are also nondominant tasks,
24 meaning they cannot be performed effectively by using well-learned behaviors (Mikulincer,
25 1989). Based on research reviewed by Kluger and DeNisi (1996), the cognitive resource
26 depletion that results from excessive self-focused attention following failure is prone to inhibit
27 performance on nondominant tasks but not on dominant (well-learned) tasks.

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3 Due to the lack of surplus cognitive resources resulting from the high attentional demands
4 of off-task thoughts (Kanfer & Ackerman, 1989; Kluger & DeNisi, 1996), to ensure they can
5 apply sufficient resources toward core task performance we expect incumbents will tend to
6 conserve attentional resources by avoiding engagement with complex and discretionary tasks
7 such as informal leadership.
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14 *Hypothesis 2:* Occupational progress failure has a negative indirect effect on informal
15 leadership behavior through ruminative thinking.
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18 **Moderation by Neuroticism**

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20 The goal progress theory of rumination also recognizes that some individuals experience
21 similar failure events more deeply than others, and that traits that predispose one to worry and
22 depression moderate the goal failure effect on rumination (Martin & Tesser, 1989). Similarly,
23 Kluger and DeNisi referred to the “tendency to blame the self, think about the self, or doubt the
24 self” as moderating failure – performance relationships (1996: 276). Recent extensions of the
25 goal progress theory of rumination predict that the adverse effect of failure on well-being is
26 stronger among persons who are more prone to ruminate (Jones et al., 2013; Roberts et al.,
27 2013). As noted by Jones et al., goal progress failures elicit “repetitive, intrusive thoughts with a
28 negative focus, which includes depressive rumination, post-event rumination, and thoughts about
29 the reasons for and implications of goal failure” (2013: 483-484). This emphasis on anxiety (“I
30 might not succeed. What then?”), depressive mood (“I am a failure.”) and a general tendency to
31 worry and feel vulnerable (“What am I to do?”) is consistent with the tripartite model of anxiety
32 and depression that underlies how the personality construct of neuroticism is represented in
33 much of contemporary research on personality (Slaughter & Kausel, 2009).
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52 As summarized by Matthews and Wells (2004), the general personality dimension of
53 neuroticism reflects the tendency to react to adverse experiences by ruminating upon them.
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3 Persons with higher neuroticism scores tend to experience adverse events more intensely and
4 have more difficulty than others in coping with uncertainty. This makes them more prone to
5 worry and have a depressed mood (Goldberg, 1999; Hirsh & Inzlicht, 2008; Slaughter & Kausel,
6 2009). This may explain why they exhibit stronger affective responses to failure (versus success)
7 feedback in laboratory experiments (Hirsh & Inzlicht, 2008). We therefore expect that neurotic
8 persons will exhibit stronger effects of occupational progress failure on ruminative thinking.
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17 *Hypothesis 3:* The positive relationship between occupational progress failure and
18 ruminative thinking is stronger among persons with higher as compared to lower levels of
19 neuroticism.
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22 In sum, we expect that persons who are more neurotic will exhibit more ruminative
23 responses to occupational progress failure (Hypothesis 3), and ruminative thinking inhibits
24 informal leadership behavior (Hypothesis 2). Thus, within our overall model, we propose that
25 neuroticism moderates the negative indirect effect of occupational progress failure on informal
26 leadership behavior (Hypothesis 2). Thus, within our overall model, we propose that
27 neuroticism moderates the negative indirect effect of occupational progress failure on informal
28 leadership behavior.
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34 *Hypothesis 4:* The negative indirect effect of occupational progress failure on informal
35 leadership behavior is stronger among persons with higher levels of neuroticism.
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37 **OVERVIEW OF STUDIES 1 AND 2**

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39 Our first study tested the hypotheses in a laboratory experiment. We also tested these
40 hypotheses in a field setting over a multiweek period, using a sample of U.S. Army trainees. In
41 this second study we assessed psychosomatic symptoms as an indirect measure of persistent
42 rumination over a more extended period. Psychosomatic symptoms refer to co-occurring
43 physical symptoms that are not readily attributable to an etiology of physical injury or disease
44 but rather to the influence of psychological responses on the neuroendocrine system (Halliday,
45 1941). Individuals tend to experience elevated psychosomatic symptoms during periods of
46 increased psychological stress (Frese, 1985). Distressed individuals often manifest such
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3 symptoms as poor sleep and appetite, dizziness, and upset stomach while being less aware of the
4 emotions or cognitions that may precipitate the symptoms. When rumination perseveres, as we
5 argue that it does following occupational progress failures until such time that one reverses the
6 failure or it becomes terminal, it results in more pronounced psychosomatic symptoms
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8 (Brosschot, Pieper, & Thayer, 2005; Ottaviani et al., 2016; Verkuil et al., 2010). This is
9 represented by the dashed arrow connecting ruminative thinking and psychosomatic symptoms
10 in Figure 1. Thus, our expectation of a positive relationship between occupational progress
11 failure and psychosomatic symptoms, as examined in Study 2, derives from the same mechanism
12 of elevated ruminative thinking we examined in Study 1.
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24 In most contexts of occupational progress failure, a substantial interval of time elapses
25 before one has an opportunity to reverse the failure. For example, after failing a component of
26 the Certified Public Accounting (CPA) exam in the United States, currently one must wait a
27 minimum of 32 days before re-taking that component. Likewise, after failing to receive an
28 expected promotion, normally a lengthy period elapses before one is again considered for
29 promotion. Perseverative cognitions theory (Brosschot et al., 2006) draws from abundant
30 laboratory and field research that indicates persisting rumination about an adverse event elevates
31 stress hormones and destabilizes the autonomic nervous system, thereby enhancing symptoms of
32 ill health, including psychosomatic symptoms (Ottaviani et al., 2016; Verkuil et al., 2010). While
33 persistent rumination can lead to elevated psychosomatic symptoms within one to a few days
34 (e.g., Emmons, 1992; Emmons & King, 1988; Verkuil, Brosschot, Meerman, & Thayer, 2012),
35 both ruminative thinking and the elevation in symptoms it presages can extend across weeks and
36 months (Firoozabadi, Uitdewilligen, & Zijlstra, 2018). Because persistent ruminative thoughts
37 about a progress failure tend to produce or worsen psychosomatic symptoms (Brosschot et al.,
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3 2005; Verkuil et al., 2010), we expected a positive relationship between occupational progress
4 failure and psychosomatic symptoms, and that psychosomatic symptoms in turn reduce informal
5 leadership behaviors.
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12 **STUDY 1: METHODS**

13 **Sample and Procedures**

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15 We recruited a sample of 99 accounting students from a private university located in the
16 Southeast United States. At the time of our study, all participants were within a few months of
17 graduating and taking the CPA exam, and passing this exam was necessary to advance their
18 career objectives. Among them, 46 reported they were male and 53 that they were female, and 73
19 were completing their master's degree in accounting. The other 26 were undergraduate
20 accounting seniors. The average age was 22.9 years. Nearly all the participants (97%) had taken
21 accounting internships with public accounting firms and/or other organizations.
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32 Students pre-registered for one of the three 2-hour experimental sessions. At the start of
33 each session, we overviewed the study procedures and informed subjects about the two separate
34 study activities: a "CPA" diagnostic accounting test and a case discussion. Before the accounting
35 test, students completed a brief on-line survey measuring personality traits. We manipulated
36 occupational progress failure by using the 30-minute accounting test. Students were randomly
37 assigned to either a very difficult test or an easy test.
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46 After the accounting test and feedback, students were provided a case requiring them to
47 identify inappropriate accounting practices brought to light by an audit of a homeowners'
48 association (Lehmann & Heagy, 2017). Students first worked individually to read the case and to
49 identify any "red flags" wherein improper accounting practices had occurred. They were given
50 15 minutes to do so before being assigned to four-person groups to complete the group
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3 assignment. This individual task helped ensure participants all processed the case in depth and
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5 were prepared to engage in a group discussion. Individual performance on this task was also used
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7 for a supplementary analysis that is described below. We directed students to different rooms for
8
9 the discussion to ensure privacy. The students were given 40 minutes to discuss and complete
10
11 two group assignment questions. After returning to the main lab room, students completed the
12
13 second on-line survey in which they reported on their own experiences and their observations of
14
15 teammates' leadership behavior in the group task. At the end of the session, students were
16
17 debriefed, and each was paid \$100.
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21 **Manipulation**

22
23 We randomly assigned students to either the treatment condition or the control condition.
24
25 Both conditions included 15 accounting questions. In the treatment condition, 11 questions were
26
27 from past Becker CPA preparation tests that were determined by the publisher to be most
28
29 difficult and four were from other CPA preparation tests. The control condition questions were
30
31 used at the host university in introductory and intermediate accounting classes and thus would be
32
33 quite easy for accounting students at this level. Subjects in both conditions were told their test
34
35 was a CPA diagnostic test. Immediately after the exam the students were given accurate results
36
37 of their exam performance (number of correct answers) and were permitted to peruse the correct
38
39 answers to each question. This general method is commonly used in research manipulating
40
41 failure in the lab (e.g., Vohs, Park, & Schmeichel, 2013). In the experimental condition (*difficult*
42
43 *exam condition*, hereafter), the mean number of correct answers out of the 15 questions was 4.49
44
45 (SD = 1.75, N =49) and the range was 1-9, whereas in the control (or *easy exam*) condition the
46
47 mean number of correct answers was 13.6 (SD = 1.33, N =50) and the range was 9-15. Thus,
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49 students in the difficult exam condition scored significantly lower on the test than those in the
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51 easy exam condition ($F_{1,97} = 849.17, p < .001$). In addition, as a manipulation check, after the
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3 exam (and before the case preparation) participants rated their agreement with the statement “I
4 performed well on the accounting test.” Compared to those in the easy exam condition (Mean =
5 3.96), students in the difficult exam condition reported that they had done more poorly on the
6 exam (Mean = 1.92; $F_{1,97} = 100.47, p < .001$). Finally, the difficult exam condition subjects
7 scored significantly lower on a 3-item measure of accounting self-efficacy (“I am competent in
8 taking accounting-related exams such as a CPA exam;” “I am better than most of my classmates
9 at tackling accounting problems;” and “I can deal just about any issues in preparing for an
10 accounting exam.” $\alpha = .85$) administered after the exam and feedback (Mean Differences = (3.83
11 – 3.19), $F_{1,97} = 10.02, p < .001$). The manipulation was therefore used to index *failure* (1 =
12 difficult exam condition, 0 = easy exam condition).
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26 Measures

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28 **Neuroticism.** We assessed neuroticism prior to the manipulation of failure using the IPIP-
29 NEO-120 (Johnson, 2014). This instrument consists of six facets, including anxiety, depression,
30 vulnerability, anger, self-consciousness, and immoderation. Each facet was measured by four
31 items, using a five-point scale ranging from 1 (= strongly disagree) to 5 (= strongly agree). We
32 measured neuroticism using facets indexing ‘anxiety’ (e.g., “I worry about things” and “I get
33 stressed out easily”), ‘depression’ (e.g., “I often feel blue” and “I dislike myself”), and
34 ‘vulnerability’ (e.g., “I panic easily” and “I feel I’m unable to deal with things”). This approach is
35 consistent with research showing that anxiety, depression, and vulnerability tend to correlate
36 highly and form one higher-order construct whereas other facets generally do not reflect the
37 same construct (Slaughter and Kausel, 2009: 272-274). We specified a higher-order confirmatory
38 factor analysis (CFA) model in which the three facets loaded on one higher-order factor, and the
39 model fit the data fairly well ($\chi^2_{(51)} = 106.64$, Comparative Fit Index (CFI) = .91, Tucker Lewis
40 Index (TLI) = .88, Standardized Root Mean Square Residual (SRMR) = .06). A higher-order
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3 CFA with all six facets loading on one factor showed significantly worse fit ($\chi^2_{(246)} = 447.01$,
4 CFI = .82, TLI = .80, SRMR = .09). We therefore focus on the composite of these three
5
6 neuroticism facets in testing our hypotheses, but present analyses of the other facets in the online
7
8 supplement (Appendix 1).
9

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12 ***Ruminative thinking.*** We measured ruminative thinking after the failure manipulation, in
13
14 the second survey that followed the group discussion. We adapted items from the rumination
15
16 measure introduced by McCullough, Bono, and Root (2007) to create a five-item measure
17
18 suitable for our study context. The five items were "I had trouble doing other things because
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20 thoughts about the accounting test kept coming into my mind," "I couldn't get thoughts of the
21
22 accounting test out of my mind even though I wanted to," "I found myself playing the unresolved
23
24 questions in the accounting test over and over in my mind," "Memories and thoughts that came
25
26 into my mind about the accounting test made me feel upset or troubled," and "Even when I was
27
28 engaged in group discussions, I thought about the accounting test."
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34 ***Informal leadership behavior.*** Following the accounting test and feedback, students were
35
36 instructed to prepare for a case discussion concerning accounting fraud. We assigned participants
37
38 to same-sex groups of four persons comprised of two persons from each experimental condition.
39
40 Constrained by the number of students who signed up for each session, there were five three-
41
42 person groups that mixed male and female students. Supplemental analyses that included only
43
44 the same sex groups produced results largely identical to those reported below.
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47
48 After the group discussion, participants rated the extent to which each teammate exhibited
49
50 leadership during the group task. We used four items to capture the demonstration of leader-like
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52 behaviors. The first two items refer to fundamental leadership behaviors that are observed across
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54 contexts (Day et al., 2004; Wellman et al., 2019), including ([This person] "provided inspiration
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3 and motivation for our team" and "provided direction and structure for our team"). The other two
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5 items were developed for this study to represent a variety of leadership behaviors commonly
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7 seen in the current group task ("encouraged our team to think about and integrate members'
8
9 ideas" and "kept us on task to ensure we delivered our requirement").¹

12 We aggregated teammates' ratings for each participant to measure his or her informal
13
14 leadership behavior in the group task. Most of the participants (85%) were rated by three
15
16 teammates, with the rest rated by two. We found adequate agreement among peer ratings of the
17
18 same participant (mean $r_{wg(j)}$ = .74; median $r_{wg(j)}$ = .87), and a significant portion of the variance
19
20 was attributable to the rater (ICC₍₁₎ = .15; ICC₍₂₎ = .34; $F_{(98, 183)} = 1.51, p < .001$).

23 **Other variables.** Prior to the failure manipulation, we measured the other four Big 5
24
25 personality traits (in addition to neuroticism as described above) using the mini-IPI (Donnellan,
26
27 Oswald, Baird, & Lucas, 2006). We controlled for extraversion and conscientiousness as these
28
29 constructs have been found to be positively related to leadership in prior research (Judge, Ilies,
30
31 Bono, & Gerhardt, 2002). We also controlled for participants' overall GPA because it is a
32
33 potential indicator of intelligence, which is a predictor of leader emergence (Judge et al., 2002)
34
35 and is related to performance on a wide range of tasks.

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38
39 Given the experimental design and the relatively small sample size (N = 99), we did not
40
41 control for other demographic variables. Notably, we found in separate analyses that none of a
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43 set of potential control variables (i.e., gender, age, program of study, experimental session, group
44
45 size) was significantly related to either ruminative thinking or informal leadership behavior, and
46
47 they did not differ across the experimental conditions. Controlling for these variables in
48
49 supplemental analyses also did not change our findings.

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55 ¹ We also asked "How often did [Peer Name] take a leadership role in our team." We found that this item had
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57 a zero-order correlation of .74 with our informal leadership measure.
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3 As noted earlier, prior to the group discussion we administered a separate individual task.
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5 Participants were asked to identify improper accounting practices ("red flags") by marking on the
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7 case with a red pen provided to them. They were instructed to leave the red pen in the lab before
8
9 leaving for the group discussion. They were also asked not to scratch or modify their individual
10
11 answers. They were provided a blue pen to make additional notes during the group discussion.
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13 Each participant's assignment was graded by an accounting instructor and one of four research
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15 assistants who were graduate accounting students. Using the list of 28 red flags provided in the
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17 case teaching note, participants were given one point for each correctly identified red flag
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19 practice. The assignment grades provided by the assistants and the instructor had a correlation
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21 of .87. On average, subjects identified 10.6 (SD = 5.13) red flags correctly.
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26 **STUDY 1: RESULTS**

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28 We conducted a confirmatory factor analysis (CFA) to assess the discriminant validity of
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30 neuroticism, extraversion, conscientiousness, and ruminative thinking. We specified neuroticism
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32 as a higher-order factor indexed by three separate facets in the CFA models, and this higher-
33
34 order factor was allowed to covary with the other three factors. The congeneric model with all
35
36 four self-reported measures produced CFI, RMSEA, and SRMR fit indices that meet
37
38 conventional thresholds of acceptable fit, whereas the TLI index was slightly lower than desired
39
40 levels (Browne & Cudeck, 1993) ($\chi^2_{(266)} = 407.89$, CFI = .90; TLI = .88; RMSEA = .07; SRMR
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42 =.07). Alternative CFAs in which we constrained the factor correlation between any two factors
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44 to unity showed worse fit. Table 1 presents the descriptive statistics and correlations of the study
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46 variables.
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51 To account for the nesting of 99 participants within 26 discussion groups, we estimated the
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53 respective models in Mplus and used the sandwich estimator (Type = cluster; Cluster =
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55 complex). This method adjusts the standard errors of the estimates (see Galbraith, Daniel, &
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3 Vissel, 2010). We controlled for students' overall GPA, neuroticism, extraversion, and
4
5 conscientiousness in testing all hypotheses. The Mplus results are summarized in Table 2. As
6
7 shown in the Model 1 column, there was a positive relationship between failure and ruminative
8
9 thinking ($a = .45$ ($se = .10$), $p < .001$). This supports Hypothesis 1. In addition, ruminative
10
11 thinking was negatively associated with informal leadership behavior ($b = -.25$ ($se = .08$), p
12
13 $< .01$). To obtain a more accurate test of the statistical significance of the indirect effect of failure
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15 on informal leadership behavior ($ab = -.11$ ($se = .04$), $p < .01$), we used a utility developed by
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17 Selig and Preacher (2008). Based on 20,000 resamplings, the 95% confidence interval of the
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19 indirect effect excluded zero (Monte Carlo CI (95%) = $-.21, -.04$). Results thus supported
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21 Hypothesis 2.
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26 ----- Insert Tables 1 and 2 and Figure 2 about here -----
27

28 Hypothesis 3 predicts that neuroticism accentuates the adverse influence of failure on
29
30 ruminative thinking. As reported in the Model 2 column (Table 2), the interaction of neuroticism
31
32 and failure predicting ruminative thinking was significant ($a = .36$ ($se = .17$), $p < .05$). The plot of
33
34 this interaction is shown in Figure 2. Consistent with our prediction, failure had a stronger
35
36 positive effect on ruminative thinking among participants reporting higher levels of trait
37
38 neuroticism (+1 SD; simple slope = $.68$ ($se = .18$), $p < .001$), compared to those with relatively
39
40 low levels of trait neuroticism (-1 SD; simple slope = $.20$ ($se = .11$), $p = .06$). These results
41
42 support Hypothesis 3.
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46 We assessed the moderated mediation effect (Hypothesis 4) by computing the conditional
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48 indirect effects of failure on informal leadership behavior among participants reporting higher
49
50 and lower levels of neuroticism. Supporting Hypothesis 4, the indirect effect of failure was
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52 significant among participants with higher levels of neuroticism (+1 SD; $ab = -.17$ ($se = .06$), p
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3 < .01, Monte Carlo *CI* (95%) = -.30, -.06), but not among those with lower levels of neuroticism
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5 (-1 SD; $ab = -.05$ ($se = .03$), $p = .11$, *CI* (95%) = -.09, .004).
6
7

8 *Supplementary Analyses*

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10 We conducted region of significance analysis to determine the range of neuroticism values
11 for which the effect of failure on ruminative thinking was statistically significant. This analysis
12 showed that the effect was significant ($p < .05$) for a neuroticism range (> 2.03) representing
13 74.7% of the participants. To examine the robustness of our results, we again tested our
14 hypotheses after excluding the control variables (i.e., extraversion, conscientiousness, and GPA).
15 Results (online Appendix 2a) did not differ materially from those reported in the paper.
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24 We also examined how failure affected individual performance as measured by the number
25 of red flags participants correctly identified for the individual assignment. Unlike informal
26 leadership behavior in the leaderless group discussion, this task was not discretionary and, based
27 on the subjects' accounting training, performance was disposed to dominant responses. We
28 regressed individual performance on the failure manipulation. As with the analyses testing the
29 hypotheses, we controlled for neuroticism, conscientiousness, extraversion, and overall GPA.
30 We found that failure did not influence individual performance ($b = -.43$ ($se = 1.13$), $p = .71$), nor
31 did neuroticism moderate the effect. In addition, the indirect effect of failure on individual
32 performance as mediated by ruminative thinking was not significant ($ab = -.58$ ($se = .40$), $p = .14$;
33 Monte Carlo *CI* (95%) = -1.47, .13).
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47 The effect of failure on ruminative thinking could be less pronounced among more
48 extraverted individuals, as their predisposition to engage with others may limit the 'alone time'
49 in which rumination predominates. Conscientious individuals demonstrate high self-discipline,
50 which may lead them to focus on executing the tasks and to more actively regulate their
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3 behavior. Accordingly, they may have a lesser tendency to become emotionally stuck and
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6 ruminative about the failure (see Conway, Csank, Holm, & Blake, 2000). Results showed that
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8 neither extraversion ($a = 0.03$ ($se = .13$), $p = .82$) nor conscientiousness ($a = 0.07$ ($se = .10$), p
9
10 $= .50$) moderated the effect of failure on ruminative thinking.

11
12 In sum, this study demonstrated that occupational goal progress failure promotes
13
14 ruminative thinking, and such rumination was negatively related to peer ratings of informal
15
16 leadership behavior in a leaderless group discussion. The indirect effect was stronger among
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18 more neurotic participants. Yet, as these were responses in the immediate aftermath of a failure,
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20 additional research was needed to assess the impact of occupational progress failure on informal
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22 leadership behavior in a naturalistic setting.
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25 26 **STUDY 2: METHODS**

27 28 **Sample and Context**

29
30 U.S. Army recruits engaged in the Basic Combat Training (BCT) course must pass a
31
32 physical fitness examination to successfully complete the training and remain in the military.
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34 Demonstrated fitness is an occupational requirement for U.S. Army infantry personnel (Knapik,
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36 Rieger, Palkoska, Van Camp, & Darakjy, 2009). Thus, failure on the mandatory fitness test is
37
38 likely to create distress within individuals based on concern they might not continue in the
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40 military. The aim of this study was to investigate the effect of *failure* on the fitness examination,
41
42 over and above the influence of *fitness level* as represented by scores on the test. Because the
43
44 examination is uniformly scored across the training cohort, we were able to make inferences
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46 about the causal effect of failure (vs. success) using a regression discontinuity design (Berk,
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48 Barnes, Ahlman, & Kurtz, 2010; Cook, Shadish, & Wong, 2008).
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53 Study participants were one company-sized military unit participating in a combined basic
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55 and advanced infantry training residential program that constituted their initial stage of entry into
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3 the military. These data were collected as part of a broader research project. Data for two
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5 previous studies were collected in this project, with one including two additional companies
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7 (Hannah, Schaubroeck, & Peng, 2016). The other included those two companies but not the
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9 company included in the present study (Schaubroeck, Peng, and Hannah 2013). Both studies
10
11 focused on the effects of behaviors of drill instructors on follower outcomes. With the exception
12
13 of performance as rated by drill instructors, which was used in a supplementary analysis in this
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15 study, there is no overlap between this study's variables and those of the other two studies.
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19 A training company is under the direction of a company commander and consists of four
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21 platoons that are supervised on a full-time basis by a drill sergeant, and he or she is occasionally
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23 assisted by one or more other drill sergeants. The platoons are further subdivided into squads of
24
25 10-15 trainees. Training and military duties were often conducted at the squad level, and soldiers
26
27 in the same squad shared sleeping quarters and continually interacted. These factors create a
28
29 suitable context within which to assess informal leadership behavior. Although the drill sergeants
30
31 were the only leaders with formal authority over the squad, they were not members of the squad
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33 *per se* and were not always present during squad activities.
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38 At the time of the study only males were permitted to serve as Infantry personnel in the
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40 U.S. Army. Participants' ages ranged from 17 to 39 ($M = 21.2$ years; $SD = 3.6$). They all
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42 reported graduating from high school or obtaining high school equivalency, and 6% had
43
44 graduated from college. Self-reports of ethnicity represented that 3% were Asian or Pacific
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46 Islander, 3% were Black, non-Hispanic, 19% were Hispanic, 64% were White, while 3%
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48 represented themselves as "Other" and 8% chose not to report their ethnicity.
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51 **Procedures**

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53 This study spanned the 14-week duration of this company's training program. The program
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55 began with the normal 10-week BCT training course, which was followed immediately by the 4-
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3 week Advanced Infantry Training. The trainees were assigned to the same squads throughout.
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5 Participation in the study was voluntary. Trainees were offered an alternative activity if they
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7 chose not to participate, but all opted to participate. Surveys were administered in an auditorium
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9 on Sundays, including the first Sunday of the training, which was one day after trainees' arrival
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11 on base (Time 1), seven weeks later (Time 2), and shortly before graduation (Time 3). A total of
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13 243 trainees provided informed consent to participate in the study at Time 1, with 218 (90%)
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15 providing data at all three periods. Failure to complete a subsequent survey was due to an
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17 assignment to other duties (e.g., security detail), illness or hospitalization, or, for a small number,
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19 a midcourse transfer to other programs. Supplemental analyses showed that dropping from the
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21 sample at any stage was not significantly related to any of the study variables.
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26 **Measures**

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28 *Occupational progress failure and fitness exercises.* Occupational progress failure was
29
30 operationalized as failing to pass the diagnostic Army Physical Fitness Test (APFT) that was
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32 administered prior to the test of record. Figure 3 shows the schedule for the three surveys across
33
34 the 14 weeks of the training. The key diagnostic fitness test was administered to trainees in their
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36 5th week of the program. This diagnostic APFT preceded by two weeks the midway survey
37
38 (Time 2; Week 7) at which we measured the hypothesized mediator. A fitness test for the record
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40 took place in the 8th week of the program. Failing that test would prevent the trainee from
41
42 graduating from BCT. The Week 5 diagnostic test was well suited to test the effect of
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44 occupational progress failure on informal leadership behavior, as it occurred when the training
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46 moved from focusing on individual tasks (e.g., map reading) toward a greater volume of
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48 activities that required interdependence at the squad level (e.g., squad battle drills) and thus
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50 informal leadership was prevalent. It also occurred sufficiently early in the training course,
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3 permitting trainees to then have nine weeks interacting with one another in team contexts,
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5 thereby grounding ratings of peers' leadership at Time 3.
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8 ----- insert Figure 3 about here -----

9 The APFT consisted of three standardized components: sit-ups, push-ups, and two-mile
10 run. Each recruit was required to pass all three components at the same examination. Component
11 scoring was standardized, ranging from 0 to 100. During the BCT phase of training scores of 50
12 or higher were needed to pass each component. Participants who fell short of the passing score
13 on any component were naturally assigned to the occupational progress failure condition.
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21 ***Psychosomatic symptoms.*** Psychosomatic symptoms were assessed at Times 1 and 2 using
22 a briefer version of the somatic complaints scale used by Ganster, Fox, and Dwyer (2001).
23 Trainees were asked how frequently (1 never – 5 very often) they experienced each of the eight
24 symptoms “during the past few weeks” (e.g., “nauseous or had an upset stomach”; “slept very
25 poorly at night”; “headache”; “poor appetite”).
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33 ***Informal leadership behavior.*** Informal leadership behavior was assessed using peer
34 ratings at the end of the training program (Time 3). Trainees were each provided the names of
35 five of their squad peers, chosen on a pseudo-random basis using the alphabetical order of last
36 names as a guide. They were asked to rate a minimum of three squad peers on a seven-point
37 scale (1 very untrue of him/her – 7 very true of him/her), “overall, based on what you have
38 observed during this training program.” The three items were “provides inspiration and
39 motivation for our team”; “provides purpose and direction for our team”; and “encourages our
40 team to think about values and ethics as a Soldier.” The distinct (not included in Study 1) item
41 concerning values and ethics ensured that the measures fit the specific informal leadership
42 context. The two items that were used in both studies are critical to leadership among peers in
43 any context.
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3 There was substantial agreement among peers in assessments of the same individual (mean
4 $rwg_{(j)} = .76$; median $rwg_{(j)} = .88$), and a considerable portion of the variance (32%) is attributable
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6 to the rateres (ICC₍₁₎ = .32; ICC₍₂₎ = .58; $F_{189, 382} = 2.39, p < .001$).²
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10 **Neuroticism.** Neuroticism was assessed at Time 1 using the mini-IPIP (Donnellan et al.,
11 2006). Trainees responded to four statements on a five-point scale (1 strongly disagree – 5
12 strongly agree) concerning “how you behave in general.” These are “I have frequent mood
13 swings,” “I am anxious most of the time,” “I get upset easily,” and “I often feel blue.” As with
14 Study 1, this measure captures anxiety, depression, and vulnerability, the core conceptual
15 elements of neuroticism (see Slaughter & Kausel, 2009).
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23 **Other variables.** We measured *conscientiousness* (e.g., “I get chores done right away.”)
24 and *extraversion* (e.g., “I talk a lot.”) with four-item scales from the mini-IPIP. As with Study 1,
25 we used these two personality variables as control variables in the core analyses.
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31 Perceiving respect from peers enhances group-serving behaviors (Tyler & Blader, 2000),
32 which increase the likelihood of being seen as a leader (Hu, Zhang, Jiang, & Chen, 2019).
33 Because group peers were aware of their groupmates’ performance on the APFT, our core
34 analysis controlled for an alternative pathway in which test failure may undermine informal
35 leadership behavior through *perceived peer respect*. Perceived peer respect was measured at both
36 Time 1 and Time 2 by adapting the six-item scale reported by Tyler and Blader (2000) to refer to
37 “my squad members” (e.g., “My squad members value me as a member”). We also controlled for
38 leader (drill sergeant) treatment using Colquitt’s (2001) 4-item *interpersonal justice* scale at
39 Time 2. A lower level of interpersonal justice could potentially contribute to psychosomatic
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53 ² A supplementary analysis of a separate Army basic training sample found a correlation of .60 between these
54 three items ($\alpha = .79$) and the five-item subscale of inspirational motivation ($\alpha = .88$) from Podsakoff, MacKenzie,
55 Moorman, and Fetter’s (1990) transformational leadership index.
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3 symptoms, and it is argued to encourage peers to have lower respect for the individual (Tyler &
4 Blader, 2000). This could lower one's potential to emerge as an informal leader. Trainees rated
5 the behaviors directed toward them ("treats me in a polite manner"; "treats me with dignity";
6 "treats me with respect"; "refrains from improper remarks or comments") of the drill sergeant
7 who was assigned full-time to their squad. As some 'tough love' from drill sergeants would be
8 expected by trainees in this context, they were instructed: "Base your ratings of your drill
9 sergeant's behavior relative to your expectations. For each behavior, answer the extent to which
10 it meets your expectations for a drill sergeant" (1 = Much worse than I expected ... 5 = Much
11 better than I expected").
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24 We controlled for *trainees' overall performance* in the program at Time 3 by specifying it
25 as an antecedent of informal leadership behavior. Higher performing individuals' initiatives and
26 opinions tend to carry more weight with peers, and they tend to be seen more as prototypical
27 members of the group. They may thus emerge more readily as leaders (Hogg, 2001). The full-
28 time drill sergeant for each squad rated the overall performance of each squad member. Three
29 items were adapted from a job performance scale used by Motowidlo and Van Scotter (1994)
30 ("performs at a high level overall," "is very effective at training tasks," and "exceeds
31 performance standards").
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42 **Analyses**

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44 We employed a regression discontinuity (RD) design. When properly applied and with
45 adequate statistical power, RD can obtain estimates of causal effects that approximate those of
46 randomized field experiments (Berk et al., 2010; Cook et al., 2008). RD approximates the effect
47 of a randomly assigned treatment when units or individuals are assigned to a treatment condition
48 purely based on scores on a rating variable(s), and a single explicit threshold applies uniformly to
49 determine placement in a condition (e.g., passing or failing). Occupational progress
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3 failure/success (“failure,” hereafter) is defined as “1” when the trainee did not meet the criterion
4 of 50 points on any one of the three dimensions on the diagnostic fitness test and “0” otherwise.

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7 We assess the effect of failure on an outcome variable after also regressing the outcome on the
8 three diagnostic test scores. A significant effect of failure indicates an abrupt change in the
9 intercept around the passing threshold using this specification:

$$14 \quad Y_i = b_0 + b_1 1 \{ \text{Score}_{cj} - 50 < 0 \} + b_2 (\text{Score}_{cj} - 50) + \varepsilon \quad [1]$$

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17 where Y_i is the vector of outcome variables (psychosomatic symptoms (Time 2) and peer-
18 rated leadership assessment (Time 3)), and $1 \{ \text{Score}_{cj} - 50 < 0 \}$ indicates whether an individual’s
19 scores on any of the three (j) fitness test components (c) were below the threshold. $\text{Score}_{cj} - 50$ is
20 the distance between the individual’s score on each component and the passing threshold. As the
21 scoring methods are uniform and no other variable aside from the test scores (i.e., Score_{cj})
22 determines failure or passing, after controlling for these scores the regression of an outcome
23 variable on the binary failure variable represents a ‘treatment’ effect of failure.
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34 As with Study 1, we tested the hypotheses using Mplus and applied the sandwich estimator
35 to account for the nesting structure in our data (i.e., trainees within squads). We controlled for
36 the prior (Time 1) measure of psychosomatic symptoms. The effect of failure on the measure of
37 psychosomatic symptoms at Time 2, two weeks after the diagnostic fitness test, can thus be
38 interpreted in terms of its effect on change in psychosomatic symptoms (Cronbach & Furby,
39 1970). Mplus adjusts the estimates for missing data based on the full information maximum
40 likelihood method (FIML), which is the preferred approach toward dealing with missing data
41 (Schafer & Graham, 2002).
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STUDY 2: RESULTS

Table 3 shows the means, standard deviations, and correlations among the analysis variables. Based on their APFT component scores (run, sit-ups, push-ups), 46 of the trainees in the final analysis sample (21%) failed the diagnostic test. One of these cases was removed as it demonstrated an outsize influence on the results based on Cook, Loglikelihood, and other outlier identification indexes generated by Mplus. However, excluding this observation was not material to any of the hypothesized effects or the levels of statistical significance. The component scores exhibited moderately high correlations with one another and with failure (1 = failing one or more test components, 0 = otherwise).

A confirmatory factor analysis (CFA) assessed the discriminant validity of the five self-reported variables assessed at Time 1, including neuroticism, conscientiousness, extraversion, peer respect, and psychosomatic symptoms. In the congeneric model in which all five factors were separate and permitted to correlate, the fit indices met or exceeded conventional standards (e.g., Browne & Cudeck, 1993; $\chi^2_{(289)} = 408.91$; CFI = .92; TLI = .91; RMSEA = .04; SRMR = .06). Alternative CFAs in which the correlation between any two factors were constrained to unity exhibited significantly worse fit. These findings support treating these factors separately in the analyses.

----- insert Tables 3 & 4 about here -----

Tests of Hypotheses

Table 4 provides the estimates from regressing informal leadership behavior, psychosomatic symptoms, and peer respect on failure and the APFT test component deviation scores (“component scores” hereafter). Model 1 in Table 4 assesses the overall effect of failure on informal leadership behavior, which was negative and significant ($b = -.70$ ($se = .28$), $p < .01$).

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3 As shown under Model 2, failure was positively related to psychosomatic symptoms ($a = .36$ (se
4 $= .09$), $p < .01$), supporting Hypothesis 1.
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8 Results for mediation and moderated mediation are also shown in Table 4. Hypothesis 2
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10 proposes an indirect relationship between failure and informal leadership behavior through
11 psychosomatic symptoms. All antecedent and control variables predicting psychosomatic
12 symptoms (failure, the three component scores and three personality variables, interpersonal
13 justice of drill sergeant, and baseline (Time 1) measures of the psychosomatic symptoms and
14 peer respect) were specified as having direct effects on informal leadership behavior. Overall
15 performance (Time 3) was also specified as a direct antecedent of informal leadership behavior.
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17 As shown in Table 4 (Model 2), psychosomatic symptoms (Time 2) was negatively related to
18 informal leadership behavior ($b = -.34$ ($se = .13$), $p < .01$). The indirect effect is negative and
19 significant ($ab = -.12$ ($se = .06$), $p < .05$; Monte Carlo CI (95%) = $-.26, -.02$), supporting
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21 Hypothesis 2.
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33 Hypothesis 3 predicts that neuroticism moderates the effect of failure on psychosomatic
34 symptoms. We centered neuroticism by its grand mean and regressed psychosomatic symptoms
35 on failure and neuroticism, and their interaction. As shown under Model 3, the interaction effect
36 was significant ($a = .35$ ($se = .12$), $p < .01$). Figure 4 shows the positive effect of failure on
37 psychosomatic symptoms among trainees with relatively high levels (+1 SD) of neuroticism
38 (simple slope = $.58$ ($se = .09$), $p < .001$), and a lack of relationship among those with relatively
39 low levels (-1 SD) of neuroticism (simple slope = $.10$ ($se = .14$), $p = .48$). This pattern supports
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41 Hypothesis 3.
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3 Hypothesis 4 predicts that neuroticism moderates the indirect effect of failure on informal
4 leadership behavior through psychosomatic symptoms. We used the same predictors as when
5 testing Hypothesis 3, and in addition controlled for trainee performance. In this model, we also
6 included the path through the hypothesized mediator (psychosomatic symptoms (Time 2)) and
7 the alternative mediator (peer respect (Time 2)) to informal leadership behavior, as well as all the
8 direct effects as assessed in testing Hypothesis 2. This analysis found that when neuroticism was
9 relatively high (+1 SD), there was a negative indirect effect of failure through psychosomatic
10 symptoms (ab (high) = $-.22$ ($se = .09$), $p < .05$), whereas there was no indirect effect when
11 neuroticism was relatively low (-1 SD) (ab (low) = $-.04$ ($se = .05$), $p = .40$). The Monte Carlo
12 confidence interval for higher neuroticism was negative (CI (95%) = $-.41, -.07$), whereas it
13 included zero for lower neuroticism (CI (95%) = $-.16, .06$). This supports Hypothesis 4.
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28 **Supplementary Analyses**

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30 To examine the robustness of our results, we tested our hypotheses again after excluding all
31 control variables. Results (see online Appendix 2b) did not differ from those reported above. We
32 also explored alternative forms of relationships between the test component scores and
33 psychosomatic symptoms and leadership. These analyses indicated no statistically significant
34 quadratic or cubic relationships. We also found no quadratic or cubic interactions of component
35 scores with failure. Accounting for scores on the fitness test of record does not influence the
36 conclusions linking diagnostic test failure to informal leadership behaviors (see Appendix 3).
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46 As in Study 1, we conducted a region of significance analysis of the interaction effect. The
47 effect of failure on psychosomatic symptoms was significant ($p < .05$) at neuroticism levels of
48 1.87 or higher, representing 72.6% of participants. We also examined the potential moderating
49 role of extraversion and conscientiousness. Extraversion ($a = -.26$ ($se = .12$), $p < .05$) and
50 conscientiousness ($a = -.30$ ($se = .10$), $p < .01$) separately moderated the relationship between
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3 failure and symptoms. For both personality variables, there is a stronger positive relationship at
4 lower levels (1-SD) (extraversion (lower): ($a = .53$ ($se = .09$), $p < .001$; conscientiousness
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6 (lower): $a = .56$ ($se = .11$), $p < .001$) compared to higher levels (extraversion (higher): ($a = .15$
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8 ($se = .15$), $p = .31$; conscientiousness (higher): $a = .16$ ($se = .07$), $p < .05$).

12 GENERAL DISCUSSION

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14 Our studies found that occupational progress failure indirectly influences informal
15 leadership behavior as assessed in a leaderless group discussion (Study 1) and in intact work
16 groups bracketed over time (Study 2). Below we discuss theoretical and practical implications of
17 these and other findings, study limitations, and future research directions.

23 Theoretical Implications

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25 The broader literature on leadership influence emphasizes the situational and personal
26 factors that lead people to attribute leader-like qualities to other persons (Hogg & van
27 Knippenberg, 2003; Lord et al., 1984). Complementing this perspective, our studies identified a
28 causal influence of adverse events, occupational progress failures, which elicit ruminative
29 thinking and thereby impedes individuals' potential to 'claim' leadership in their group (DeRue
30 & Ashford, 2010). Our theorizing does not suggest that following occupational progress failure
31 individuals devote more cognitive resources to core tasks than they would in the absence of such
32 off-task effort. Rather they have less surplus cognitive resources owing to the ruminative
33 thinking, thus limiting their potential to be effective in meeting the demands of both core tasks
34 and complex peripheral (non-core) tasks. Prioritization of core tasks owing to a more limited
35 overall pool of cognitive resources is consistent with the findings of both studies. Ruminative
36 thinking was not related to task performance, assessed as an objective performance score on an
37 audit task in Study 1 and rated performance on the core military training tasks in Study 2,
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3 suggesting that effort on core tasks may have been unaffected while discretionary informal
4 leadership behaviors suffered.
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8 The majority of participants who failed the diagnostic test in Study 2 had passed the test of
9 record three weeks after the initial failure. A supplementary analysis showed no effect of the
10 failure on psychosomatic symptoms as assessed at the conclusion of the training ($b = .11$, $se =$
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The majority of participants who failed the diagnostic test in Study 2 had passed the test of record three weeks after the initial failure. A supplementary analysis showed no effect of the failure on psychosomatic symptoms as assessed at the conclusion of the training ($b = .11$, $se = .18$, $p = .52$). Bearing in mind that an increase in psychosomatic symptoms observed in the middle of the training was attributable to the failure event and, theoretically, ruminative thinking about the failure, this pattern is consistent with the goal progress theory of rumination (Martin & Tesser, 1989). As we noted, the theory proposes that rumination about failure tends to cease after the failure is reversed or it is no longer relevant, as when the higher-order goal (e.g., becoming a soldier) is either attained or no longer maintained. However, there was a persevering effect of the earlier increase in symptoms on ratings of informal leadership that were measured at the end of the training. This suggests that, owing to their lesser capacity to engage in leadership at one stage in the training (between initial failure and failure resolution), many were not able to establish themselves as leaders among their peers in the final six weeks of the training when they were no longer subject to the resource drain of off-task effort that may be attributed to concern about the failure. Having missed the opportunity to emerge as a leader initially may later make it difficult to establish leadership, because peers' initial view of one as not being willing or able to inspire or direct the team is likely to persist. First impressions have a significant impact on the informal leadership structures that emerge in groups (DeRue, Nahrgang, & Ashford, 2015), and early leadership experiences influence members' perceptions of an individual's fit with their prototype of a leader (Lord et al., 1984). Lack of involvement in leadership also reduces the formation of a personal identity as a leader in general or as a leader in a particular context such as one's current

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3 job (DeRue & Ashford, 2010; Lord & Hall, 2005). Whereas many individuals simply do not
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5 establish themselves as leaders owing to their lack of ability or desire to lead, our findings
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7 suggest that occupational progress failures deprive individuals of resources they need to exhibit
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9 leadership and it may be difficult to establish leadership after regaining such resources.
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12 The effect of occupational progress failure on ruminative thinking (Study 1) and
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14 psychosomatic symptoms (Study 2) was significant across the majority of participants, although
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16 these relationships were stronger among individuals reporting higher neuroticism. Neurotic
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18 persons are more prone to ruminative thinking when faced with negative feedback and/or
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20 uncertainty (Hirsh & Inzlicht, 2008). Research has also shown that personality traits such as
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22 conscientiousness and extraversion are positively associated with acts of informal leadership (Hu
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24 et al., 2019; Judge et al., 2002). Examining our Study 2 moderation findings for neuroticism,
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26 conscientiousness, and extraversion from a different perspective indicates that personality traits
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28 predicted psychosomatic symptoms and, in turn, informal leadership behavior among persons
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30 who had experienced an occupational progress failure, whereas these traits did not exhibit
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32 significant effects among those who had not failed. Taken together, this finding suggests that
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34 focusing on the simple effects of traits on informal leadership behavior, as established in prior
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36 research, may be limiting because it overlooks critical adverse events that occur intermittently
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38 during many individuals' careers. When these events occur early in one's entry to a group or
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40 organization they may limit the potential to establish oneself as a leader.
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47 In our studies any ruminative thinking that was tied to the failure event was not plausibly a
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49 productive use of cognitive resources to achieve one's higher-order goal. In the field study, for
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51 example, trainees who failed the diagnostic test did not likely ruminate persistently about how to
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53 do pushups or sit-ups, or about how to better perform their daily training tasks. Yet, in other
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3 contexts an occupational progress failure could encourage individuals to devote energy and
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5 attention to reversing the failure, such as when one reflects on ways to improve performance or
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7 remind oneself about areas that require more concerted attention (Dane, 2018; Kuhl, 1987). Due
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9 to the high cognitive accessibility of an uncompleted task (Martin & Tesser, 1989), this type of
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11 problem-focused rumination may potentially help one engage with tasks in the failed domain.
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13 The literature indicates that in general, problem-focused rumination does not have the adverse
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15 psychological or psychosomatic effects of affective, self-focused rumination that pertains to
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17 reliving a failure and dwelling on its personal implications (Firoozabadi et al., 2018; Kinnunen,
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19 Feldt, and de Bloom, 2019). Nevertheless, such problem-focused rumination drains cognitive
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21 resources, including the additional effort required to maintain focus while frequently switching
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23 attention to the goal activity (Koch, Poljac, Müller, & Kiesel, 2018). For example, after failing to
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25 pass a CPA exam section, an individual might devote time away from her core tasks to study, or
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27 one's thoughts may readily drift to accounting concepts that are less relevant to the job but
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29 concern possible test material.
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35 We utilized psychosomatic symptoms as a proxy for persistent ruminative thinking in
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37 Study 2 for practical reasons, but it is important to consider the boundaries around which such
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39 symptoms represent the theoretical effect of ruminative thinking. We attribute the failure effect
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41 on psychosomatic symptoms to persistent ruminative thinking based on three observations. First,
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43 from Study 1 and other laboratory studies (e.g., Geisler & Kubiak, 2009; Koole et al., 1999;
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45 Roberts et al., 2013; Thompson et al., 2002), as well as field studies of individuals' self-reports
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47 of goal failures and rumination (Lavalley & Campbell, 1995; Moberly & Watkins, 2010), there is
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49 a reliable causal effect of such failures on ruminative thinking. Second, the relationship between
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51 rumination and symptoms of this nature is demonstrated to be quite strong (see the meta-analysis
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3 results of Ottaviani et al., 2016) and in the direction of rumination presaging the symptoms rather
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5 than the reverse effect or mere comorbidity (Brosschot et al., 2005). Thus, combining these
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7 observations and the effect of failure on Time 2 symptoms in Study 2, it is reasonable to infer
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9 that ruminative thinking among those who failed had elevated their psychosomatic symptoms.
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11 Third, we found in Study 2 that symptoms did not persist after the goal progress failure was
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13 reversed, as is expected by the goal process theory of rumination and supported by other findings
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15 (Koole et al., 1999; Wrosch, Scheier, Miller, & Carver, 2003).
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19 **Practical Implications**

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21 These findings have implications for how organizations approach requirements they place
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23 on employees that extend beyond core job duties, and how they manage members' temporary
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25 failures in meeting these requirements. Organizations neither can, nor should, seek to shield
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27 individuals from failure, especially as failures often promote learning and thus better long-term
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29 performance (Deichmann & van den Ende, 2013). Yet as our findings indicate, occupational
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31 progress failures promote ruminative thinking and ultimately psychosomatic symptoms, which
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33 can detract from performance on complex non-core tasks such as informal leadership.
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37 Organizations can often do more to assist employees' preparation to succeed in meeting
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39 important occupational benchmarks, such as by providing time or financial assistance to study
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41 for a certification test. For those who failed important occupational benchmarks, managers can
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43 provide personal support, such as by encouraging them to take a more growth-oriented mindset
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45 toward their job and career goals as is found to enhance individuals' development as leaders
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47 (Dragoni, Tesluk, Russell, & Oh, 2009). This may better ensure that any mind wandering
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49 associated with work goals "might gravitate toward being more goal directed rather than goal
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51 digressive (i.e., unnecessarily stressful)" (Dane, 2018: 192).
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3 Because the propensity for occupational progress failure to reduce informal leadership does
4 not necessarily reflect a lower personal competency or desire for leadership, and the adverse
5 effect on informal leadership may persist well after the eliciting event, managers may form false
6 negative views of certain individuals' leadership potential. One approach to overcome this would
7 be for managers to approach workers who have reversed occupational progress failures with an
8 opportunity to engage in leadership in a setting in which a leadership structure is not already
9 established, such as by chairing a new committee. In addition, individuals are less prone to
10 ruminating about failure when they receive affirming information about their progress toward the
11 same higher-order goal (Brunstein & Gollwitzer, 1996; Koole et al., 1999). By recognizing the
12 achievements and contributions of followers who recently experienced occupational progress
13 failures, leaders may help to promote their engagement in informal leadership.
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29 **Limitations and Future Directions**

30 Limitations of these studies lead us to view the findings with some caution. An important
31 limitation is that the designs of our studies did not permit us to assess the underlying serial
32 mediation process wherein occupational progress failure influences psychosomatic symptoms
33 through ruminative thinking. In an ideal study, researchers would randomly administer goal
34 process failure and bracket daily levels of the focal variables. Such a design could determine how
35 ruminative thinking over a sustained period may fluctuate and influence psychosomatic
36 symptoms and affect informal leadership behaviors in turn.
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46 Although occupational progress failure did not affect performance on core tasks in either
47 study, core task performance might be influenced by heightened level of ruminative thinking and
48 psychosomatic symptoms in other settings. Dane (2018) noted that mind wandering is most
49 costly in jobs that require careful monitoring of one's surroundings, intensive detail work, and
50 avoidance of errors, which characterizes the work in many occupations, such as emergency
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3 technicians, dining servers, and laboratory technicians. Other outcomes that are separate from
4 dominant task domains also merit attention. Ethical behavior and safety behavior may both
5 potentially suffer following occupational progress failures because these behaviors involve
6 dealing with ambiguous cues and they often conflict with efforts to maximize core task
7 performance.
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14 While over 20% of the trainees in Study 2 initially failed the test, which is comparable to
15 failure rates for other occupational certifications (e.g., ASCP Board of Certification Research
16 and Development Committee, 2015), the proportion of test-takers who initially fail on other
17 certifications, as for the Certified Public Accountant designation in the United States, is much
18 higher. A high base rate of failure may indicate a very difficult test, and individuals who see
19 colleagues they believe are more capable also fail may believe they are unlikely to ever pass.
20 Conversely, failing when there is a lower base rate of failure may be more demoralizing as it
21 may makes failure a more personal matter. We thus encourage research on the relationship
22 between failure base rates and ruminative thinking.
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35 Finally, our studies were conducted in a single country, and leadership perceptions are
36 theoretically affected by cultural variables (Lord & Brown, 2001). Research has shown that
37 individuals from the Eastern cultures are more sensitive to failure than those from the Western
38 cultures (Heine, Kitayama, Lehman et al., 2001; Kitayama et al., 1997). For example, Japanese
39 participants may engage in self-criticism to a greater extent than Americans when responding to
40 a failure situation (Kitayama et al., 1997). Owing to the intense self-blame and negative affect
41 that may encourage more rumination following significant personal failures, occupational
42 progress failure might have a greater adverse influence on informal leadership in Eastern cultures
43 than what we found in these U.S. samples.
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Conclusions

This research provides a first step toward a theory of how failure events that occur in naturalistic settings, or that are manipulated in the lab, interact with employees' traits to influence their intrapsychic states and subsequent leadership behavior. More generally, it calls for a new emphasis on the would-be leaders' cognitive processes that influence how they are perceived as leading among peers, specifically highlighting the role of ruminative thinking in linking occupational progress failure events with informal leadership behavior. Considering the growing evidence linking a wide range of work experiences to employees' ruminative thinking, persistent ruminative thinking and its attendant psychosomatic symptoms may serve an important mediating role in a broader theory of leadership.

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TABLE 1 Correlations and Descriptive Data among Analysis Variables (Study 1)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Failure (T2)	0.49	0.50												
2. Ruminative thinking (T3)	1.29	0.59	.38**	(.92)										
3. Informal leadership behavior (T3)	3.46	0.59	-.05	-.23*	(.83)									
4. Neuroticism (T1)	2.51	0.66	.02	.20*	.04	(.90)								
5. Conscientiousness (T1)	3.48	0.92	.03	.08	.03	.02	(.88)							
6. Extraversion (T1)	2.99	0.76	-.02	-.11	.22*	-.17	-.05	(.77)						
7. GPA	3.37	0.97	.13	.02	-.11	.09	.01	.02						
8. Age	22.91	1.61	-.02	-.02	-.10	-.04	-.00	.02	.13					
9. Gender	1.54	0.50	.15	-.03	.11	.31**	.08	-.17	.07	-.13				
10. Program of study ^a	1.74	0.44	-.01	.06	.02	.03	-.00	-.07	.36**	.48**	-.14			
11. Group size ^b	3.85	0.36	.02	.04	-.08	.22*	-.22*	-.05	.17	.17	.00	.20		
12. Session 1 ^c	0.39	0.49	.03	.02	-.05	-.01	-.05	-.10	.13	.02	.21*	.06	.17	
13. Session 2 ^c	0.37	0.49	-.01	.10	-.02	-.02	.06	.12	-.10	-.02	-.29**	-.06	-.20*	-.62**

Note. N = 99 (Listwise). Failure was coded as 1 = difficult exam condition, 0 = easy exam condition. Alpha reliability coefficients are shown in the parentheses.

p* < .05, *p* < .01.

^a Program of study was coded: 1 = undergraduate accounting, 2 = master's in accounting.

^b Group size denotes the number of participants in the case discussion group, which is either 3 or 4.

^c Session1 and Session 2 are dummy variables representing the three experimental sessions.

TABLE 2 Coefficients for Main and Interactive Effects of Failure on Ruminative Thinking and Informal Leadership Behavior (Study 1)

	Model 1 ^a				Model 2 ^a			
	Ruminative Thinking		Informal Leadership Behavior		Ruminative Thinking		Informal Leadership Behavior	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
GPA	-.03	.04	-.08	.04	-.02	.03	-.08	.04
Extraversion	-.06	.05	.17**	.06	-.07	.06	.18**	.06
Conscientiousness	.04	.06	.04	.08	.02	.06	.04	.08
Neuroticism	.17*	.08	.12	.09	-.01	.06	.14	.12
Failure	.45**	.10	.07	.13	.44**	.10	.07	.13
Failure × Neuroticism					.36*	.17	-.04	.17
Ruminative thinking			-.25**	.08			-.25**	.08
R ²	.19		.13		.23		.13	

Note. N = 99; * $p < .05$, ** $p < .01$. Coefficients are unstandardized.

^a Model 1 and Model 2 refer to two separate SEM models tested using Mplus.

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TABLE 3 Correlations and Descriptive Data among Analysis Variables (Study 2)

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Failure	0.21	0.41														
2. Informal leadership behavior (T3)	4.83	1.46	-.29**	(.98)												
3. Push-ups deviation score	24.20	18.60	-.53**	.26**	--											
4. Sit-ups deviation score	23.86	19.00	-.62**	.18*	.51**	--										
5. 2-mile run deviation score	27.43	18.28	-.45**	.25**	.50**	.36**	--									
6. Psychosomatic symptoms (T1)	1.75	0.61	.22**	-.15	-.13	-.16*	-.24**	(.76)								
7. Psychosomatic symptoms (T2)	1.53	0.64	.34**	-.23**	-.21**	-.26**	-.15*	.41**	(.84)							
8. Peer respect (T1)	3.52	0.70	-.14	.02	.13	.07	.08	-.14	-.16*	(.92)						
9. Peer respect (T2)	3.98	0.76	-.21**	.29**	.29**	.23**	.16*	-.22**	-.31**	.38**	(.94)					
10. Interpersonal justice (T2)	3.90	0.88	-.16*	.06	.17*	.12	.16*	-.10	-.25**	.26**	.47**	(.93)				
11. Neuroticism (T1)	2.30	0.70	.02	-.03	.04	.01	.01	.23**	.14	-.06	-.01	-.00	(.68)			
12. Extraversion (T1)	3.12	0.74	-.12	.09	.12	.06	.01	.02	.02	.28**	.24**	.22**	.07	(.65)		
13. Conscientiousness (T1)	3.41	0.67	-.03	-.00	.06	-.01	.09	-.09	-.10	.19**	.17*	.20**	.06	.03	(.62)	
14. Task performance (T3)	5.30	1.20	-.20**	.34**	.25**	.22**	.27**	-.21**	-.18**	-.07	.22**	.09	-.16*	.05	-.05	(.90)

Note. Pairwise Ns range from 182 (Leadership) to 217 (Failure, exercise scores). * $p < .05$, ** $p < .01$

TABLE 4 Main and Interactive Effects on Psychosomatic Symptoms (PSS), Peer Respect, and Informal Leadership Behavior (Study 2)

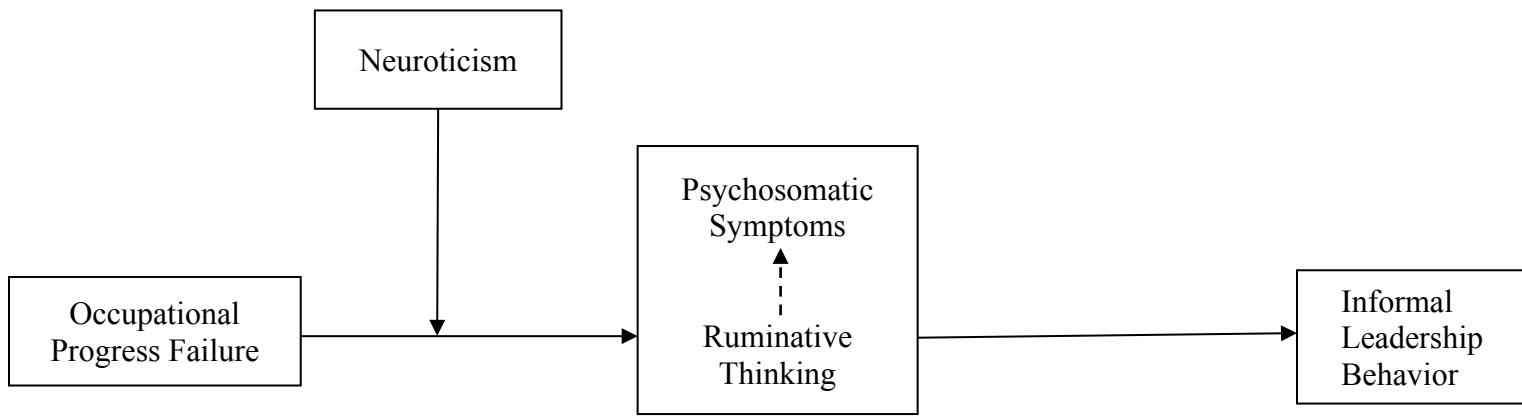
	Model 1 ^a		Model 2 ^a				Model 3 ^a							
	Informal Leadership Behavior (T3)		PSS (T2)		Peer Respect (T2)		Informal Leadership Behavior (T3)		PSS (T2)		Peer Respect (T2)		Informal Leadership Behavior (T3)	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
PSS (T1)	-.11	.13	.34**	.09	-.18	.11	.07	.15	.33**	.08	-.17	.11	.08	.15
Peer Respect (T1)	-.06	.18	-.04	.07	.23**	.06	-.20	.17	-.03	.07	.23**	.06	-.19	.17
Interpersonal Injustice (T2)	.00	.12	-.14**	.04	.30**	.06	-.16	.11	-.13**	.04	.31**	.06	-.15	.10
Performance Rating (T3)	.31**	.10					.26**	.09					.27**	.09
Test Failure	-.70**	.28	.36**	.09	.10	.17	-.60*	.27	.34**	.08	.09	.17	-.58*	.29
Push-ups deviation score	.01	.01	-.00	.00	.01	.00	.00	.01	-.00	.00	.01*	.00	.00	.01
Sit-ups deviation score	-.01	.01	-.00	.00	.01	.00	-.01	.01	-.00	.00	.01	.00	-.01	.01
2-mile run deviation score	.01	.01	.00	.00	-.00	.00	.01	.01	.00	.00	-.00	.00	.01	.01
Neuroticism	.01	.14	.05	.03	.03	.04	.00	.16	-.04	.05	-.00	.04	-.08	.19
Extraversion	.14	.09	.08	.06	.10	.07	.12	.09	.07	.05	.09	.07	.11	.08
Conscientiousness	-.02	.11	-.03	.06	.05	.05	-.10	.12	-.03	.06	.05	.05	-.10	.12
Failure × Neuroticism									.35**	.12	.13	.14	.34	.30
PSS (T2)							-.34**	.13					-.38**	.13
Peer Respect (T2)							.53**	.13					.52**	.14
R ²	.19		.29		.36		.27		.31		.37		.27	

Note. * $p < .05$, ** $p < .01$. Coefficients are unstandardized.

^a Models 1, 2, and 3 refer to separate SEM models tested using Mplus.

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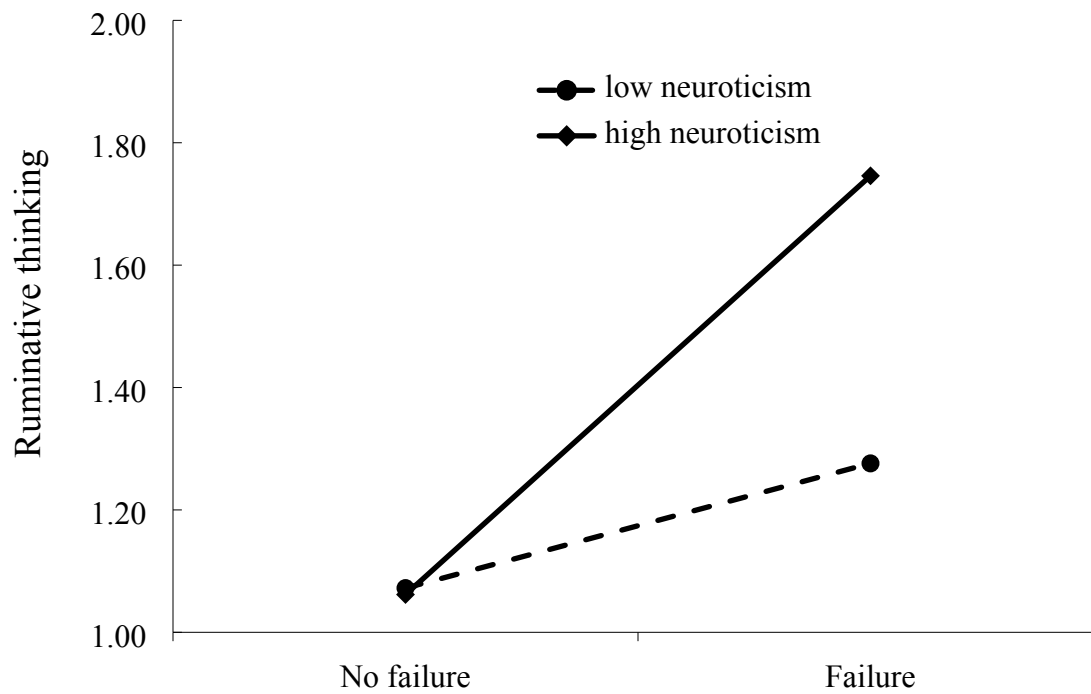
FIGURE 1 Research Model



Note: The dashed arrow depicted in the figure represents a conceptual connection that is consistent with prior research. It is not tested in the studies. Study 1 assesses a path through Ruminative Thinking, and Study 2 assesses a path through Psychosomatic Symptoms.

FIGURE 2 Plot of the Interaction of Occupational Progress Failure with Neuroticism Predicting

Ruminative Thinking (Study 1)



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FIGURE 3 Timeline of the Study Design (Study 2)

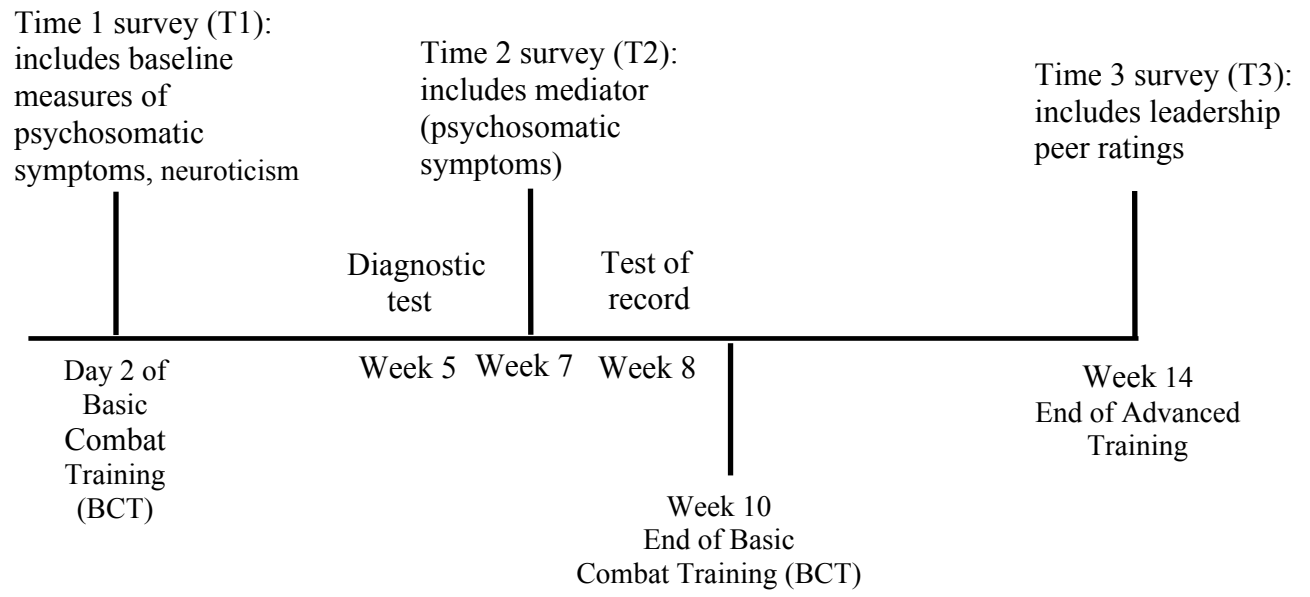
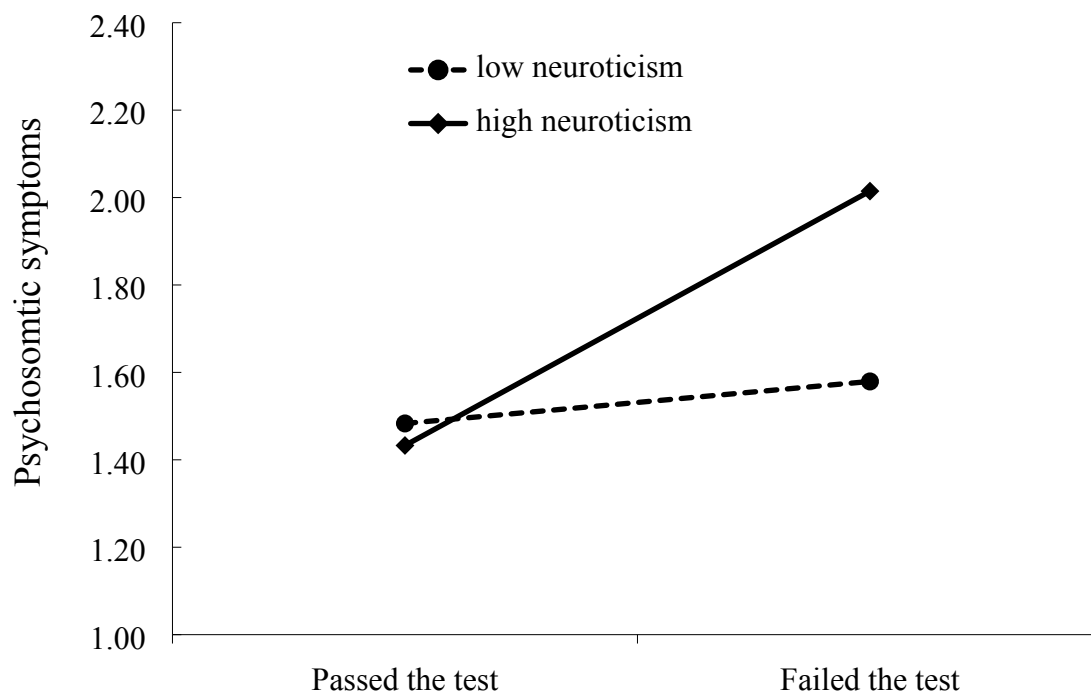


FIGURE 4 Plot of the Interaction of Occupational Progress Failure with Neuroticism Predicting

Psychosomatic Symptoms (Study 2)



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3 **John M. Schaubroeck** (schaubroeck@missouri.edu) is Robert J. Trulaske, Sr. Chair of
4 Management at the University of Missouri's Trulaske College of Business. His research focuses
5 on leadership processes and well-being. He received his PhD from the Krannert Graduate School
6 of Management at Purdue University.
7

8
9 **Ann C. Peng** (cpeng@missouri.edu) is an Associate Professor and the Raymond W. Lansford
10 Distinguished Professor of Leadership at the University of Missouri's Trulaske College of
11 Business. She received her Ph.D. in Management at Michigan State University and a master's
12 degree from Lingnan University of Hong Kong. Dr. Peng's research interests include leadership,
13 emotions, work stress, and employee performance.
14

15
16 **Sean Hannah** (hannahst@wfu.edu) is Tylee Wilson Chair of Business Ethics at Wake Forest
17 University School of Business, is a retired US Army Colonel, and Fellow of SIOP and APS. His
18 PhD is from the University of Nebraska, and he foremost researches leadership.
19

20
21 **Jingjing Ma** (maj@ust.hk) is an assistant professor of management at the Hong Kong University
22 of Science and Technology. Her research studies leadership, stress, and ethics. She received her
23 PhD from Michigan State University.
24

25
26 **Anna M. Cianci** (cianciam@wfu.edu) is an associate professor of accounting in the School of
27 Business at Wake Forest University. Her research focuses on the impact of goals, corporate
28 governance, and various pressure-inducing stimuli (e.g., regulations, incentives) on ethical
29 judgment, decision making and performance. She received her PhD from the Fuqua School of
30 Business at Duke University.
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