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Could two negative emotions be a positive? The effects of anger and anxiety in enemyship

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HIGHLIGHTS

- Demonstrates critical role of anger in enemyship using appraisal theory
- Feeling angry at an enemy after feeling anxiety has positive effects on motivation.
- This effect is mediated by perceptions of control and certainty.
- Found support for moderated mediation model across three studies
- Implications for approach-avoidance literature

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ABSTRACT

Enemyship is an important but understudied interpersonal phenomenon. Prior research on this topic has focused on enemyship's cognitive, control-maintenance function following a threat. The present studies advance theory and research by showing the role of emotion, particularly anger, in this process. Using appraisal theory as a framework, we draw on recent research into approach and avoidance motivational dynamics during threat. We propose an interaction between anxiety-inducing threat and enemy-directed anger on perceptions of control and certainty, and motivation. More specifically, we expect that when an anxiety-inducing threat is present, perceptions of control and certainty will be significantly higher when enemy-directed anger is also present than when it is not. Additionally, we sought to demonstrate the consequences of these processes for motivation. Perhaps counterintuitively, we propose that individuals who experience anger at an enemy following an anxiety-inducing control threat will experience a boost in motivation, an effect mediated by perceptions of control and certainty. We find support for our moderated mediation model across three studies with undergraduate and working adults (Total $N = 673$).

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1. Introduction

While there is a long tradition and contemporary literature connected with the study of intergroup enmity in social psychology (e.g., Halperin & Sharvit, 2015), *interpersonal* enemyship is a comparatively understudied topic. We define *enemyship* as the perception that another person or group is using influence and power to undermine one's goals and well-being. Despite a lack of empirical attention, enemyship is a common phenomenon both worldwide (Adams, 2005; Shweder, Much, Mahapatra, & Park, 1997) and in North American settings (Holt, 1989). Many people in the United States report an enemy relationship

with a co-worker (e.g., an enemy competing with the self for a promotion; Wiseman & Duck, 1995).

Given the prominence and importance of interpersonal enemyship, some researchers have recently examined its psychological function. This research has focused on the social cognitive function of enemyship, and indicates that individuals may perceive enemyship partly for the counterintuitive purpose of maintaining perceived individual control and certainty¹ after an experienced threat. Certainly perceived

¹ Control and certainty – though conceptually distinct – are closely related in phenomenological experience. Certainty is the degree to which future events seem predictable and comprehensible, while control is the degree to which events seem to be brought about by individual or situational agency (Lerner & Keltner, 2000, 2001). Classic theoretical perspectives in social science converge with recent research to suggest that perceived order in the environment (certainty) is the psychological basis for perceptions of personal control (Kay, Laurin, Fitzsimons, & Landau, 2014; Kay et al., 2015). Hence, in any given context, perceptions of certainty (e.g., regarding how to navigate the environment, what kind of tasks to perform) are likely to be strongly linked with perceptions of personal control.

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enemyship is threatening in and of itself; but it can be seen as the lesser of two evils when the individual is reminded of more ambiguous and unpredictable hazards (e.g., economic uncertainty; disease; accidents). Threats to personal control and certainty often take the form of such reminders, which suggest that the environment is disordered and threat randomly distributed (Becker, 1969). The fact that an enemy can be clearly identified as a focal, anthropomorphic source of threat should increase a sense of personal control in the wake of uncertainty-related anxiety. However unpleasant, a human enemy can at least be understood and predicted (Becker, 1969; Hoffman, 1983).

Prior studies have provided support for this social cognitive account of enemyship (Rothschild, Landau, Sullivan, & Keefer, 2012; Sullivan, Landau, & Rothschild, 2010). However, no research has yet examined the role of emotion in enemyship. Specifically, we propose that a critical, previously overlooked aspect of control maintenance in enemyship is the emotional experience of anger. Indeed, anger is often conceptualized as an emotion directed at perceived enemies (Averill, 1982). Beyond ignoring the role of emotion, prior studies have also not yet considered the implications of enemyship for motivation. Using appraisal theory, the present research addresses these gaps and thereby advances the burgeoning literature on enemyship.

More broadly, our studies make a critical contribution to the literature on threat-defense processes in social psychology (Jonas et al., 2014). A growing consensus in this literature is that individuals initially respond to threats with avoidance motivation, but then compensatorily shift to approach motivation after an opportunity to defend against the threat. However, the vast majority of studies supporting this model rely on main effect or correlational mediational designs (Greenaway et al., 2015; Jonas et al., 2014). The present studies adopt an interactional approach better suited to testing this model by first manipulating avoidance-oriented emotion (anxiety) and subsequently manipulating the opportunity for approach-oriented emotion (anger), in order to test the combinatorial impact of threat and defense on control, certainty, and motivation.

1.1. Appraisal theory and the role of anger in enemyship

Recent studies have established the social cognitive function of perceived enemyship as a control maintenance tactic. For instance, Sullivan et al. (2010) found that participants reminded of chaotic potential hazards in their environment (e.g., accidents, disasters) were relatively more likely to attribute power to an enemy, suggesting that enemies serve a motivated cognitive function of control restoration after threat. Additional studies have replicated and extended these effects by showing that increased blame attributions to enemies after control threats are mediated by a perceived decrease in personal control (Rothschild et al., 2012).

While this research provides a compelling social cognitive account of enemyship, our understanding of the phenomenon remains incomplete on the basis of this work alone. There is a long-standing tradition in social psychology of explaining behavior as a function of cognition, emotion, and motivation (e.g., Lazarus, 1991; Westen, 1985). This traditional perspective suggests that, beyond a cognitive function, enemyship should also involve emotion and have consequences for motivation.

In appraisal theory, emotions are conceptualized as componential “episodes” or “experiences” that originate in appraisals of a novel environmental stimulus (Ellsworth, 2013; Ellsworth & Scherer, 2003). Appraisal theory identifies the specific dimensions upon which individuals evaluate this novel event in the environment, such as certainty – the degree to which this event is perceived as understandable and clear – and control – the degree to which the event is predictable and brought about by individual (as opposed to situational) agency (Ellsworth & Smith, 1988; Lerner & Keltner, 2000; Tiedens & Linton, 2001). The experience of anxiety involves the appraisal of an external event as low in certainty and low in individual control, while the experience of anger involves high

certainty and high individual control (Ellsworth & Scherer, 2003; Smith & Ellsworth, 1985). Being in a state of uncertainty is fundamentally uncomfortable and potentially dangerous (Higgins, 2011). Thus, when confronted with anxiety and uncertainty, individuals search for clear goals and contingencies to guide behavior and increase control and certainty (Fennis & Wiebenga, 2015; Sherif & Harvey, 1952), and they invoke a variety of direct and indirect strategies to achieve this aim (Higgins, 2011; Kay, Sullivan, & Landau, 2015). We propose that one such tactic would be to experience anger when given the opportunity. With anger, it is clear who or what caused the event (perhaps an enemy) and how it has or how it will affect the individual (Gibson & Callister, 2010). Thus, we hypothesize that the experience of anger towards an enemy can serve a palliative function.

How might anger play a role in the established process through which contemplating an enemy after threat increases perceived control and certainty? A broad emerging consensus suggests that defensive responses to anxiety-provoking threats often follow an avoidance-approach cognitive-motivational sequence (Greenaway et al., 2015; Jonas et al., 2014). That is, individuals who have experienced a threat to their control or certainty initially feel anxiety and are directed toward an avoidance orientation – they are vigilant in scanning their environment for threat and seek to withdraw from the environment or threatening targets if possible. In an ongoing temporal sequence, individuals in this state then typically attempt to increase control and certainty by seeking some means of psychological defense, which often takes the form of a symbol or target (e.g., an enemy). If such a potential defense mechanism can be identified, individuals then compensatorily shift to an approach motivation – indeed, they often experience a surge in motivation to compensate for the threat (Jonas et al., 2014).

We believe that experiencing anger at an identified enemy is the crucial means through which individuals increase perceived control and certainty via enemyship. In contrast to anxiety, anger is referred to explicitly as an “approach related affect” (Carver & Harmon-Jones, 2009, p. 183), and relates to an approach motivational system. By focusing on a specific source of uncontrollability (e.g., an enemy) after a control threat, the individual gains a cognitive foothold for translating the avoidance-oriented emotion of anxiety into the approach-oriented emotion of anger. According to appraisal theory, anger is a control- and certainty-restorative emotion (Lerner & Keltner, 2001), and this paves the way for taking approach-oriented action in one’s environment.

We should be clear about the limitations, applicability, and purpose of our current analysis. We are not claiming that anger is the *only* emotion that can increase a sense of control in the wake of an uncertain threat – from the perspective of appraisal theory, any emotion associated with high control and high certainty could have a similar function (Whitson, Galinsky, & Kay, 2015). However, we do propose that anger is the most likely negatively valenced emotion to fulfill this function. In particular, we focus on anger because in the important applied context of interpersonal enemyship this is a very common emotion, which we believe contributes to the control-restorative function of enemies identified in the literature.

At the same time, we are also not claiming that anger is the *only* emotion that one can experience toward an enemy. Clearly, one can also fear an enemy. However, drawing once more on appraisal theory, we would not expect fear at an enemy to have a control-restorative function (given that fear is associated with appraisals of low certainty and low control). Accordingly, for reasons of both theoretical and applied significance, in the present studies we focus on the palliative potential of anger experienced at an enemy, while recognizing that other emotions in other contexts could serve a similar purpose, and that anger is not the only emotion people experience toward their enemies.

1.2. Implications for motivation

The past literature on enemyship has not only overlooked the potentially critical role of anger, but has also failed to explore an important

counterintuitive consequence of perceiving enemies after a control threat – namely, an increase in motivation in the wake of anxiety. Perceptions that one can actually deploy change in the environment and that one is certain about the state of the environment (e.g., whether or not it is stable and predictable) increase the chances that one will be motivated to enact change (Liang, Farh, & Farh, 2012). Within the context of threat and defense, prior literature suggests that an opportunity to defend against a control threat should lead to subsequently elevated levels of motivation. In the absence of opportunity or dispositional ability to activate psychological defenses, individuals show decreased motivation in response to uncontrollable threats (Hayes, Ward, & McGregor, 2016; Routledge et al., 2010). However, the model of an avoidance–approach sequence implies that when given a clear opportunity to defend against anxious uncertainty, previously threatened individuals should show a compensatory shift in approach-oriented motivation to perform (Jonas et al., 2014).

Applying these arguments to the specific phenomenon of enemyship yields an interesting and unexpected hypothesis. Specifically, we would expect participants threatened by reminders of global uncontrollability to show decreased levels of motivation. However, since experiencing anger at an enemy may provide a foothold for a general approach orientation, it is likely that the combinatorial experience of threat-induced anxiety and enemy-directed anger will actually *boost* both motivation to perform and actual performance of approach-oriented tasks in comparison to mere anxiety or mere anger. That is, experiencing two types of negative emotion in sequence could actually generate surprisingly high levels of motivation.

2. Overview of studies

Most of the literature to date testing the general avoidance–approach sequence in threat–defense processes relies on main effect designs, correlational mediational designs, or mixed-model designs investigating an induced threat and an individual difference variable (Jonas et al., 2014). In the present studies we adopted an interactional framework. This involves first manipulating a control threat designed to evoke an avoidance-oriented emotional state (anxiety), and subsequently manipulating the opportunity to defend against this threat through enemy attributions (associated with the approach-oriented emotion of anger), before assessing perceived control and certainty as well as motivation.

Drawing on the preceding theoretical analysis, we propose that, in the absence of an enemy figure, a control threat will increase anxiety and reduce perceptions of control and certainty. However, if individuals are able to identify and experience anger toward a responsible enemy, the threat will be muted or eliminated. The combinatorial experience of anxiety and subsequent anger will increase control and certainty. Since perceptions of control and certainty are positively related to motivation (Ajzen, 1991), we expect that the interactive effect of threat-induced anxiety and enemy-directed anger should actually boost motivation in comparison to experiencing just anxiety, just anger or just identifying an enemy.

Summarizing and distilling the foregoing theoretical analysis, we hypothesize that:

Hypothesis 1. There will be an interaction between control threat and enemy-directed anger on perceptions of control and certainty.

Hypothesis 1a. When a control threat is present, perceptions of control and certainty are significantly higher when enemy-directed anger is present than when it is not.

Hypothesis 2. There will be an interaction between control threat and enemy-directed anger on motivation.

Hypothesis 2a. When a control threat is present, motivation is significantly higher when enemy-directed anger is present than when it is not.

Hypothesis 3. The indirect effect of control threat on motivation through perceptions of control and certainty is moderated by enemy-directed anger, such that the indirect effect is only significant when enemy-directed anger is present.

To test our moderated mediation model we conducted three studies exploring the effects of anxiety-inducing control threats and enemy-directed anger. Study 1 provides preliminary support for our model by investigating the interactive effect of these variables on perceived control and certainty as well as self-reported motivation. Study 2 provides further support for our analysis with a detailed examination of the process through which the manipulations elicit the observed effects. Finally, Study 3 demonstrates the applicability of these findings by investigating how enemyship processes affect objective measures of performance – a reflection of heightened motivation. We report all measures, manipulations, and exclusions in these studies and in the Supplementary Materials verbatim. In the Supplementary Materials Appendix A, we also report results from a preliminary study we conducted. The findings in that study did not provide statistical support for our model. We believe this was due to the ineffectiveness of our original manipulations, as inferred from the manipulation checks.

3. Study 1

3.1. Participants and procedure

Study 1 was conducted using a sample of 157 undergraduate students ($M_{\text{age}} = 19.26$, 47% female) at a large U.S. university. Participants were randomly assigned to condition in a 2 (control threat: absent vs. present) \times 2 (enemy-directed anger: absent vs. present) between-subjects factorial design. For simplicity, we refer to the control threat-absent condition as the “baseline” group. Based on a recent meta-analysis on perceived control, compensatory control, need for structure, and control motivation (Landau, Kay, & Whitson, 2015), we aimed for a medium effect size of 0.25 for each interaction. A G*Power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) determined that a sample size of 128 participants total (32 for each of the four experimental cells) would be adequate to obtain 80% power to detect our hypothesized interactions at $\alpha = 0.05$. When possible we tried to increase the sample size to ensure robustness (see also Pittarello, Leib, Gordon-Hecker, & Shalvi, 2015), and ended up with a total sample size of 157 participants (29 more than what was considered adequate). We originally collected 160 participants, but dropped three participants from the sample because they did not fully complete the study. Due to this incompleteness, we did not record which condition they were originally in. However, we have no reason to believe that the excluded participants were more likely to be assigned to one condition instead of another. We did not collect any additional data after analyzing the current data set. Upon random assignment to condition, participants completed manipulation checks and self-report measures of perceptions of control and certainty and motivation.

3.2. Manipulations and measures

3.2.1. Control threat

In both conditions, participants read an article adapted from prior articles that had appeared in *The New York Times*. Participants were instructed to read the article carefully, as they would be asked to answer questions afterwards. The articles in both the control threat and no threat conditions were approximately the same length and similar in topic. In the *control threat* condition participants read an article describing the difficulty young adults faced in finding a job after graduating from college. Specifically, participants read about adults with bachelor's degrees taking low-level jobs in retail and customer service because they were unable to find long-term positions commensurate with their educational level. This article was particularly relevant to our

sample of undergraduate college students pursuing a degree in the social sciences, and was therefore likely to induce anxiety regarding their uncertain future. After reading the article students were instructed to write three uncertainties they had about how they would be able to find and keep a job in the present economy.

In the *baseline* condition the article was presented as a learning styles task through which the researchers could measure personality by examining how individuals learn from certain materials, such as newspaper articles. The article described young adults interviewing for jobs and some of the social gaffes committed, such as dressing inappropriately. After finishing the article, participants were instructed to write three new things they had learned or would like to learn.

3.2.2. Manipulation check I

To assess the effectiveness of our manipulation, participants rated the degree to which they were currently experiencing 21 emotion adjectives on a scale ranging from (1) *do not feel at all* to (9) *feel stronger than I ever have* (similar to the anchor points used in the Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988). The survey included five items ($\alpha = 0.85$) intended to measure anxiety (*anxious, tense, uncomfortable, fearful, scared*). The remaining items were fillers (e.g., *happy*). Participants were then randomly assigned to read a second article that was intended to induce either enemy-directed anger or no specific emotion.

3.2.3. Enemy-directed anger

In both conditions, participants were told that the researchers were interested in people's opinions about various aspects of the current economic crisis in the country. Participants in the *enemy-directed anger* condition read about one of the current senators at the time of the crisis. The article described how several economists viewed this senator as one of the key figures that caused the current global recession, and noted that the senator expressed no remorse for his actions. After reading the article participants were asked to consider how the senator's actions made them angry, and were told to write three paragraphs describing how the economic recession personally affected them or those they loved. This article was intended to induce anger at a clear, identifiable enemy figure.

Participants in the *no enemy-directed anger* condition read an article about the subprime mortgage crisis. The article described the proposed causes of the crisis, such as excessive consumer housing debt, mortgage-backed securities, and high levels of approval to subprime mortgage consumers. Upon completion of the article, participants were instructed to take a moment and consider the crisis. They were then told to write three paragraphs about how the crisis would affect them personally, their loved ones, and their generation. The articles used for both the anger and no anger conditions were approximately the same length and concerned the economic crisis. However, the anger condition uniquely provided participants with a specific enemy figure who could be blamed for the crisis, while such a figure was absent in the no anger condition.

3.2.4. Manipulation check II

To verify that our manipulation had the intended effect on participant emotion, participants again rated the degree to which they were currently experiencing 21 emotion adjectives on a scale ranging from (1) *do not feel at all* to (9) *feel stronger than I ever have*. The survey included three items ($\alpha = 0.85$) intended to measure anger (*angry, mad, irritated*). The remaining items were fillers (e.g., *sad*).

3.2.5. Perceptions of control and certainty

After completing the second manipulation check, participants answered a set of four questions ($\alpha = 0.73$) on a scale from (1) *strongly disagree* to (7) *strongly agree* pertaining to their feelings of control and certainty about work life after graduation from college adapted from Sullivan et al. (2010). Example questions included “I have control over

my future”, and “I am certain what my post-graduation job will be.” A confirmatory factor analysis (CFA) supported a single underlying dimension for the measure, $\chi^2(2) = 4.59, p = 0.10$, comparative fit index (CFI) = 0.98, Tucker-Lewis index (TLI) = 0.95, root-mean-square error of approximation (RMSEA) = 0.09, standardized root mean square residual (SRMR) = 0.03.

3.2.6. Motivation

Participants then answered two questions ($\alpha = 0.81$) on a scale from (1) *not motivated at all* to (7) *very motivated* we devised about their current motivation to work towards their future careers: “How motivated are you to find a job after graduation?” and “How motivated are you to attend career fairs in the future?”

4. Study 1 results

See Table 1 for a summary of the means and standard deviations for all the following variables. See Table 2 for a correlation matrix of all variables. We did not include any covariates in any of our analyses.

4.1. Manipulation checks

Participants in the control threat condition reported feeling significantly more anxious than participants in baseline condition, $t(155) = 3.44, p = 0.001$, Cohen's $d = 0.55$, attesting to the effectiveness of our first manipulation and supporting the overall idea that control threats are associated with anxiety. A similar comparison of scores on the second manipulation check revealed that participants in the enemy-directed anger condition reported feeling significantly angrier than those in the no enemy-directed anger condition, $t(155) = 1.98, p = 0.049$, Cohen's $d = 0.32$. There was no interaction between control threat and enemy-directed anger on the second manipulation check, $F(1, 153) = 0.61, p = 0.437, \eta^2 = 0.004$. Our manipulations had no effects on the other emotions measured (see Appendix H in the Supplementary Materials section).

4.2. Perceptions of control and certainty

We submitted the control and certainty measure to a 2 (control threat: absent vs. present) \times 2 (enemy-directed anger: absent vs. present) ANOVA. Consistent with Hypothesis 1, this analysis yielded the expected crossover interaction pattern, $F(1, 153) = 6.72, p = 0.010, \eta^2 = 0.042$ (see Fig. 1). There was no main effect of enemy-directed anger, $F(1, 153) = 0.13, p = 0.715, \eta^2 = 0.001$, nor of control threat, $F(1, 153) = 0.13, p = 0.715, \eta^2 = 0.001$ (not an error). Within the control threat condition, participants in the enemy-directed anger condition reported significantly higher perceptions of control and certainty than participants in the no enemy-directed anger condition, $t(153) = 2.08, p = 0.039$, Cohen's $d = 0.46$, supporting Hypothesis 1a.

4.3. Motivation

We then performed the same 2 \times 2 ANOVA using our motivation measure as the dependent variable. The predicted crossover interaction was observed: $F(1, 153) = 4.20, p = 0.042, \eta^2 = 0.027$, supporting Hypothesis 2 (see Fig. 1). There was no main effect of enemy-directed anger, $F(1, 153) = 0.007, p = 0.935, \eta^2 = 0.000$, nor of control threat, $F(1, 153) = 0.41, p = 0.525, \eta^2 = 0.003$. However, Hypothesis 2a was not supported. Within the control threat condition, participants in the enemy-directed anger condition did not report significantly higher motivation than participants in the no enemy-directed anger condition, $t(153) = 1.50, p = 0.135$, Cohen's $d = 0.33$.

Table 1
Means and standard deviations per condition among Study 1 variables.^{a,b}

| | Baseline | | Control threat | |
|----------------------------|----------------------|-------------------------|----------------------|-------------------------|
| | Enemy-directed anger | No enemy-directed anger | Enemy-directed anger | No enemy-directed anger |
| <i>n</i> | 42 | 37 | 36 | 42 |
| Anxiety score ^c | 3.54 (1.65) | 2.61 (1.49) | 3.88 (1.54) | 4.10 (1.67) |
| Anger score ^d | 3.80 (1.88) | 2.99 (2.04) | 3.41 (1.89) | 3.06 (1.68) |
| PCC ^e | 4.04 (1.16) | 4.50 (1.37) | 4.65 (1.25) | 4.04 (1.42) |
| Motivation ^f | 5.12 (1.13) | 5.49 (1.08) | 5.63 (1.13) | 5.21 (1.42) |

^a Total *n* = 157.

^b Standard deviations are shown in parentheses.

^c Scores measured on a scale from one to nine; administered after the control threat induction.

^d Score measured on a scale from one to nine; administered after the enemy-directed anger induction.

^e Abbreviation for perceptions of control and certainty; self-report scale measured on a scale from one to seven.

^f Self-report scale measured on a scale from one to seven.

4.4. Moderated mediation

Hypothesis 3 proposes moderated mediation, which signifies that the strength of an indirect effect is contingent upon the moderator (Preacher, Rucker, & Hayes, 2007). Specifically, we hypothesized that the indirect effect of a control threat on motivation through perceptions of control and certainty is observed only when an individual is angry at an enemy. In order to provide evidence for moderated mediation, the index of moderated mediation must be significantly different from zero.

This index is a direct quantification of the linear association between the indirect effect and the moderator of that effect. It indicates whether the indirect effect is significantly different for each value of the moderator (Hayes, 2015). If the bootstrap confidence interval generated for the index does not include zero, this leads to the inference that moderated mediation is present. Identifying which indirect effect at which particular level of the moderator is significant involves generating bootstrap confidence intervals for each indirect effect at each particular level of the moderator. If the confidence interval does contain zero, then there is the possibility that mediation does not exist for that particular level of the moderator. However, if this interval does not include zero, there is evidence that mediation is present for that particular level of the moderator. An SPSS macro (Hayes, 2013) provided the estimates for the conditional indirect effects. We used the Monte Carlo approach for constructing bootstrap confidence intervals in estimating the effects (Bauer, Preacher, & Gil, 2006; Shrout & Bolger, 2002).

We entered control threat (absent vs. present) as the independent variable, perceptions of control and certainty as the mediator, motivation as the dependent variable, and enemy-directed anger (absent vs. present) as the moderator. The estimates, standard errors, and bias-corrected 95% confidence intervals for the conditional indirect effects using 10,000 bootstrap resamples indicate that the indirect effect of control threats on motivation through perceptions of control and certainty is significant when enemy-directed anger is present, coefficient = 0.13, SE = 0.08, CI [0.02, 0.34]. However, the indirect effect is not significant when enemy-directed anger is absent, coefficient = -0.10, SE = 0.08, CI [-0.31, 0.01]. The index of moderated mediation was

significantly different from zero as indicated by the fact that the 95% bias-correct confidence interval did not include zero, coefficient = 0.22, SE = 0.13, CI [0.04, 0.56], suggesting that the indirect effects depend on the value of the moderator, and supporting **Hypothesis 3**.

5. Study 1 discussion

Generally, the findings of Study 1 are consistent with our analysis, particularly for the theorized crossover interaction pattern: Participants experiencing threat-induced anxiety who are presented with an opportunity for anger at an enemy showed higher perceptions of control and certainty, as well as higher motivation, compared to those not provided with the opportunity. The results of our mediation analysis support the proposed psychological process, namely, that the buffering effect of anger on motivation after an experience of anxiety is due to an increase in perceptions of control and certainty.

However, we did not find full support for the specific pairwise comparisons (**Hypothesis 2a**). We want to be very careful in not over-interpreting non-significant results. Rather, we propose that since we did observe the predicted cross-over interaction and mediation there was a good case for performing another test of our model with greater power in a larger sample size (Button et al., 2013; LeBel et al., 2013).

In addition to replicating and probing the interaction in a larger sample, we were interested in determining whether our overall interaction was driven by (a) the cognitive reassurance that a relevant enemy can be blamed for the control threat, (b) the “mere” experience of the emotion of anger (i.e., it is possible that experiencing anger at any target would increase feelings of control and certainty after anxiety), or (c) the combination of both a relevant enemy figure and the emotional experience of anger at that enemy. Since mere contemplation of an enemy and anger at that enemy were confounded in our design, we were unable to answer this question definitively in Study 1.

In sum, it remains unclear exactly what aspect of our enemy-directed anger induction is responsible for boosting perceptions of control and certainty and motivation after the experience of anxiety. In line with our conceptual framework, we predict that the specific combination of experiencing anger at an enemy following a control threat is key. Cognitively, the knowledge that one's anxiety can be traced to the actions of one individual is reassuring and reduces uncertainty, thus increasing perceptions of control and certainty (Sullivan et al., 2010). However, the emotional experience of expressing anger towards this enemy is essential to increasing motivation, as anger is an approach-oriented emotion that can rejuvenate psychological energy after an experience of threat (Carver & Harmon-Jones, 2009; Harmon-Jones & Allen, 1998). Thus, we propose that participants who can both attribute their prior uncertainty to an enemy and express anger towards that enemy will show higher levels of control, certainty, and motivation compared to those who are only given the opportunity for a cognitive attribution or emotional experience alone.

Table 2
Descriptive statistics and correlations among variables in Study 1.

| Variable | <i>M</i> | <i>SD</i> | 1. | 2. | 3. | 4. | 5. | 6. |
|---------------|----------|-----------|-------|-------|-------|-------|------|----|
| 1. Anxiety | 3.79 | 1.74 | – | | | | | |
| 2. Anger | 3.32 | 1.88 | 0.43* | – | | | | |
| 3. PCC | 4.29 | 1.32 | –0.09 | –0.07 | – | | | |
| 4. Motivation | 5.34 | 1.21 | 0.03 | –0.04 | 0.23* | – | | |
| 5. Gender | 0.47 | 0.50 | –0.02 | –0.03 | –0.08 | –0.04 | – | |
| 6. Age | 19.26 | 1.07 | 0.04 | 0.04 | 0.05 | –0.04 | 0.01 | – |

^a Total *n* = 157.

Gender coded as 0 = Male, 1 = Female.

* *p* < 0.01.

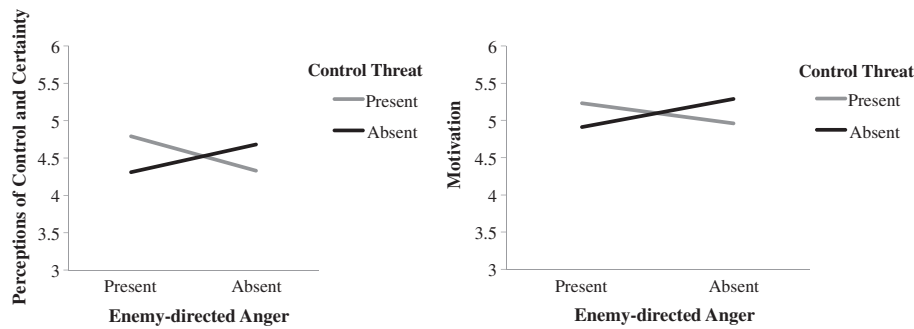


Fig. 1. The left graph displays the interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. present) on perceptions of control and certainty, and the right graph displays the interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. present) on motivation in Study 1. Both variables were measured on a seven-point scale.

In order to test this more specified version of our theoretical model, we designed a study in which we were able to separate these effects. We predicted that only participants in the enemy-directed anger condition would show heightened perceptions of control and certainty and motivation after experiencing an anxiety-inducing control threat.

6. Study 2

6.1. Participants and procedure

For this study, we used a sample of 397 working adults ($M_{\text{age}} = 34.37$, 56% female) in the U.S. recruited from Amazon Mechanical Turk. A G*Power analysis (Faul et al., 2007) indicated that a sample size of 179 participants total (approximately 23 participants for each of the eight experimental cells) would be required to obtain 80% power to detect an effect size of 0.25 at $\alpha = 0.05$ for our hypothesized interactions. However we wanted to recruit a larger sample to insure maximum power for a more complex design among a more heterogeneous population, and ended up with approximately 50 participants per condition (218 more than the sample size considered adequate). We were able to originally collect 480 participants for a target of 60 per condition, but we dropped 83 participants from the sample due to the fact that these participants did not fully complete the study. We did not record which condition they were originally in, though there is no reason they should not have been randomly distributed across conditions. We did not collect any additional data after analyzing the current data set. Pre-selection criteria guaranteed that only full-time, part-time and self-employed workers could participate in the study. The average job tenure was 5.10 years ($SD = 5.36$). The workers were employed in a variety of professions, including (but not limited to), marketing, sales and service (13%), education and training (12%), business, management and administration (10%), health science (9%), and information technology (9%). Most participants reported an income that fell between \$25,000 and \$40,000. Participants were randomly assigned to condition in a 2 (control threat: absent vs. present) \times 4 (enemy-directed anger: absent vs. only anger vs. only enemy vs. present) between-subjects factorial design. As many employees in the U.S. report enemies in the workplace, we used widely applicable manipulations concerning the participants' professions.

6.2. Manipulations and measures

6.2.1. Control threat

Participants assigned to the *control threat* condition were asked to describe three major uncertainties they had about their current job. More specifically, we instructed them to try and think of uncertainties about their job which made them feel anxious. Participants assigned to the *baseline* condition were asked to describe three things they disliked about the technology at their current job. We instructed them

to try and think of devices or software used at their job that occasionally made them feel mildly bothered. We believe this neutral condition provides an especially conservative test for our hypotheses because it is also intended to induce an unpleasant feeling – mild annoyance – rendering the presence of uncertainty (and not general negativity) the only salient difference between the two conditions.

6.2.2. Manipulation check I

We used the same manipulation check employed in Study 1 and averaged the anxiety items ($\alpha = 0.92$).

6.2.3. Enemy-directed anger

In the *absent condition* (no enemy or anger), participants were asked to take a moment and think about the last building they were in and to describe it in as much detail as they could, writing at least three paragraphs.

In the *only anger* condition, anger was experimentally induced by the writing task developed by Strack, Schwarz, and Gschneidinger (1985), and validated in multiple studies (e.g., Dunn & Schweitzer, 2005; Huntsinger, 2013; Kugler, Connolly, & Ordóñez, 2012; Milkman, 2012; Norton & Gino, 2014; Tiedens & Linton, 2001; Todd, Forstmann, Burgmer, Brooks, & Galinsky, 2015). Participants were asked to write in detail (at least three paragraphs) about a time when they vividly experienced anger. They were asked to imagine how the specific emotion felt, to describe the experience of the emotion, and to avoid including any other feelings in their descriptions.

In the *only enemy* condition, participants were reminded that they had previously written about issues connected to their current job (either technology-related or uncertainty-related). We asked them to take a moment and think about an individual other than themselves who is responsible for these problems. They were asked to consider the actions of that person, and why or how that person was responsible for these problems at their job, writing at least three paragraphs. Importantly, this induction did not explicitly prompt anger.

In the *enemy-directed anger* condition, participants were reminded that they had previously written about issues connected to their current job. We asked them to take a moment and think about an individual other than themselves who is responsible for these problems. They were instructed to consider how the actions of that individual made them angry and to try to actually experience the anger, writing at least three paragraphs.

6.2.4. Manipulation check II

We used the same manipulation check employed in Study 1, averaging the anger items ($\alpha = 0.93$).

6.2.5. Perceptions of control and certainty

After completing the second manipulation check, participants answered a set of four control and certainty questions ($\alpha = 0.79$)

regarding their work life on a scale from (1) *strongly disagree* to (7) *strongly agree* adapted from Sullivan et al. (2010). Example questions included “I have control over my job” and “I am certain of the duties required of me at my job.” A CFA supported a single underlying for the measure, $\chi^2(2) = 8.96, p = 0.01, CFI = 0.99, TLI = 0.97, RMSEA = 0.09, SRMR = 0.02$.

6.2.6. Motivation

We used a five-item measure ($\alpha = 0.93$) to capture motivation. Participants answered the questions on a scale from (1) *strongly disagree* to (7) *strongly agree* adapted from Weld and Funk (2005). Example questions included “I am motivated to be a good employee” and “I am motivated to perform highly at work.” A CFA supported a single underlying dimension for motivation, $\chi^2(5) = 48.02, p < 0.001, CFI = 0.97, TLI = 0.95, RMSEA = 0.07, SRMR = 0.03$.

7. Study 2 results

See Table 3 for a summary of the means and standard deviations for all the following variables. See Table 4 for a correlation matrix of all variables. We did not include any covariates in any of our analyses.

7.1. Manipulation checks

Overall, participants in the control threat condition reported feeling significantly more anxiety than participants in the baseline condition, $t(395) = 2.64, p = 0.008, Cohen's d = 0.27$, suggesting that the manipulation was successful. We then compared responses to the second manipulation check. Overall, participants in the two anger conditions (only anger and enemy-directed anger) reported feeling significantly more angry than participants in the no anger conditions (absent and only enemy) conditions, $t(395) = 7.61, p < 0.001, Cohen's d = 0.76$. There was no interaction between the control threat and enemy-directed anger manipulations on our second manipulation check, $F(3, 389) = 0.75, p = 0.521, \eta^2 = 0.006$. There was also no significant difference in anger scores between participants in the only anger condition and those in the enemy-directed anger condition, $t(395) = 0.95, p = 0.340, Cohen's d = 0.13$. These results suggest that the manipulations were successful in inducing the intended psychological states. Once again, our manipulations had no effects on the other emotions measured (see Appendix H in the Supplementary Materials).

7.2. Perceptions of control and certainty

We submitted the perceptions of control and certainty measure to a 2 (control threat: absent vs. present) \times 4 (enemy-directed anger: absent vs. only anger vs. only enemy vs. present) ANOVA. There was no main effect of control threat, $F(3, 389) = 0.03, p = 0.875, \eta^2 = 0.000$. However, the analysis did yield a main effect of enemy-directed anger, $F(3, 389) = 3.54, p = 0.015, \eta^2 = 0.027$, which was qualified by the

Table 4
Descriptive statistics and correlations among variables in Study 2.

| Variable | M | SD | 1. | 2. | 3. | 4. | 5. | 6. |
|---------------|-------|-------|--------|--------|-------|------|------|----|
| 1. Anxiety | 3.67 | 2.20 | – | | | | | |
| 2. Anger | 3.62 | 2.37 | 0.55* | – | | | | |
| 3. PCC | 5.07 | 1.24 | –0.44* | –0.36* | – | | | |
| 4. Motivation | 5.47 | 1.33 | –0.24* | –0.21* | 0.42* | – | | |
| 5. Gender | 0.56 | 0.50 | 0.07 | –0.04 | 0.00 | 0.04 | – | |
| 6. Age | 34.37 | 10.44 | 0.01 | 0.01 | 0.07 | 0.03 | 0.08 | – |

^a Total $n = 397$.
Gender coded as 0 = Male, 1 = Female.
^{*} $p < 0.01$.

expected interaction, $F(3, 389) = 3.12, p = 0.026, \eta^2 = 0.023$ (see Fig. 2). This supports Hypothesis 1.

To determine whether perceptions of control and certainty are primarily influenced by the experience of pure anger, the identification of an enemy, or the combinatorial experience of enemy-directed anger, we performed a series of pairwise comparisons. Consistent with Hypothesis 1a, within the control threat condition, scores in the enemy-directed anger condition were significantly higher than those in the absent condition, $t(389) = 3.05, p = 0.002, Cohen's d = 0.67$, the only anger condition, $t(389) = 3.33, p = 0.001, Cohen's d = 0.70$, and the only enemy condition $t(389) = 2.66, p = 0.008, Cohen's d = 0.66$. These results, paired with large effect sizes, support our prediction that it is the dual experience of identifying an enemy and feeling anger that increases perceptions of control and certainty after the experience of a control threat.

7.3. Motivation

We performed the same set of analyses with motivation entered as the dependent variable. Once again, the predicted interaction reached significance: $F(3, 389) = 3.28, p = 0.021, \eta^2 = 0.025$ (see Fig. 2), supporting Hypothesis 2. There was no main effect of enemy-directed anger, $F(3, 389) = 1.97, p = 0.117, \eta^2 = 0.015$, nor of control threat, $F(3, 389) = 2.48, p = 0.116, \eta^2 = 0.006$. Importantly, within the control threat condition, scores in the enemy-directed anger condition were higher than those in the absent condition, $t(389) = 2.89, p = 0.004, Cohen's d = 0.71$, the only anger condition, $t(389) = 1.94, p = 0.053, Cohen's d = 0.49$, and the only enemy condition, $t(389) = 1.94, p = 0.053, Cohen's d = 0.54$, supporting Hypothesis 2a. Overall, these results support our hypothesis that, in the wake of a control threat, it is the identification of a relevant enemy and the experience of anger at that enemy that increases motivation in comparison to either experiencing only anger or only identifying an enemy. Again, the considerable effect sizes also suggest that these results are not trivial.

Table 3
Means and standard deviations per condition among Study 2 variables.^{a,b}

| | Baseline | | | | Control threat | | | |
|----------------------------|-------------|-------------|--------------------|-------------|----------------|-------------|--------------------|-------------|
| | Absent | Only anger | A + E ^c | Only enemy | Absent | Only anger | A + E ^c | Only enemy |
| <i>n</i> | 48 | 49 | 42 | 56 | 61 | 56 | 44 | 41 |
| Anxiety score ^d | 3.12 (1.76) | 3.34 (1.91) | 2.85 (1.94) | 2.96 (1.90) | 3.75 (2.27) | 3.72 (2.26) | 3.38 (1.86) | 3.44 (1.85) |
| Anger score ^e | 2.70 (1.85) | 4.42 (2.11) | 4.53 (2.63) | 3.10 (2.16) | 2.36 (1.72) | 4.84 (2.49) | 4.14 (2.54) | 3.20 (2.22) |
| PCC ^f | 5.30 (1.08) | 4.74 (1.36) | 5.07 (1.49) | 5.27 (1.05) | 4.90 (1.21) | 4.82 (1.33) | 5.64 (1.00) | 4.93 (1.15) |
| Motivation ^f | 5.71 (1.21) | 5.01 (1.52) | 5.42 (1.54) | 5.39 (1.52) | 5.30 (1.23) | 5.53 (1.26) | 6.05 (0.83) | 5.49 (1.20) |

^a Total $n = 397$.
^b Standard deviations are shown in parentheses.
^c Abbreviation for enemy-directed anger condition.
^d Score measured on a scale from one to nine; administered after the control threat induction.
^e Score measured on a scale from one to nine; administered after the enemy-directed anger induction.
^f Self-report scale measured on a scale from one to seven.

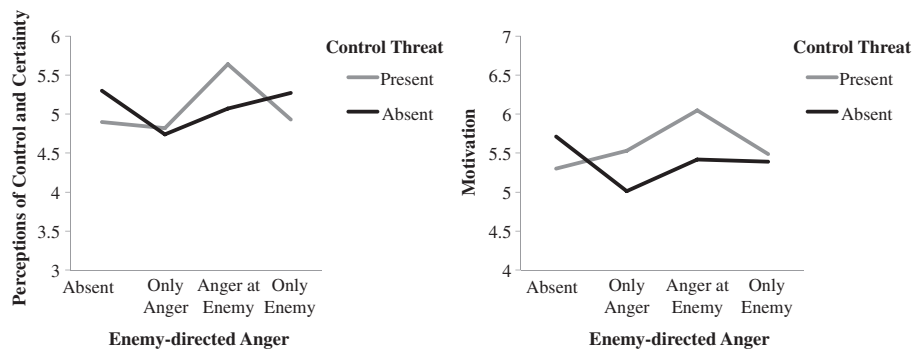


Fig. 2. The left graph displays the interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. only anger vs. anger at enemy vs. only enemy) on perceptions of control and certainty, and the right graph displays the interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. only anger vs. anger at enemy vs. only enemy) on motivation in Study 2. Both variables were measured on a seven-point scale.

7.4. Moderated mediation

To test moderated mediation, we used the same analytical technique as Study 1. We entered control threat (absent vs. present) as the independent variable, perceptions of control and certainty as the mediator, motivation as the dependent variable and enemy-directed anger (absent condition only vs. present) as the moderator. The indirect effect was significant when enemy-directed anger was present, coefficient = 0.25, SE = 0.13, CI [0.04, 0.56] but not when enemy-directed anger was absent, coefficient = -0.17, SE = 0.10, CI [-0.40, 0.01]. The index of moderated mediation did not include zero, coefficient = 0.42, SE = 0.17, CI [0.13, 0.83], once again suggesting that the indirect effects depend on the value of the moderator, and supporting Hypothesis 3.

We also tested moderated mediation using a different coding scheme. We collapsed all the conditions except for enemy-directed anger into one variable (“absent”). We then entered control threat (absent vs. present) as the independent variable, perceptions of control and certainty as the mediator, motivation as the dependent variable and enemy-directed anger (absent vs. present) as the moderator. The indirect effect was significant when enemy-directed anger was present, coefficient = 0.26, SE = 0.13, CI [0.03, 0.53] but not when enemy-directed anger was absent, coefficient = -0.10, SE = 0.06, CI [-0.23, 0.02]. The index of moderated mediation did not include zero, coefficient = 0.36, SE = 0.15, CI [0.10, 0.67], once again suggesting that the indirect effects depend on the value of the moderator, and supporting our hypothesis.

8. Study 2 discussion

The results of Study 2 provide strong evidence for our theoretical account that it is the combinatorial experience of anger at a specific enemy following an experience of anxiety that drives perceptions of control and certainty and motivation. That is, the mere experience of anger or the mere salience of a relevant enemy following threat is not exclusively responsible for our results. Using broadly applicable and conservative manipulations, we believe that this study serves as compelling evidence for our theoretical narrative, which holds that the experience of anger towards a relevant enemy figure following an anxiety-inducing control threat increases perceptions of control and certainty and motivation.

We tested the robustness of our model even more thoroughly in a third study. Specifically, we aimed to extend our model in two ways. First, we wanted to probe the applicability of our findings to real-world situations. Doing so can possibly provide practitioners, such as marketers or managers, with some potential advice on how to address specific types of anger and anxiety perceived among consumers and employees. To try and achieve this end we operationalized motivation as effort and performance on different tasks.

Second, we wanted to address the possibility that our findings in the first two studies were significantly influenced by methodological

factors. Different biases associated with priming, lay theories, and self-report could account for a portion of the variance in our models. For instance, in the two previous studies we asked participants the extent to which they were experiencing anxiety and anger. By explicitly directing attention to these emotions, there could have been an unintentional priming effect, whereby participants' emotional states were influenced by a type of implicit signal that they “should” or “should not” be experiencing certain emotions, not exclusively because of the induction (for similar concerns and procedures see Kugler et al. (2012)). To avoid this possibility, we did not collect manipulation check data in this study.

Similarly, there could be a lay theory (an expectation or belief; Zammuner, 2000) that feeling in control and certain is positively linked to motivation (Vroom, 1964). This could lead participants to report “superficially inflated” motivation. That is, because participants expect that being in control and feeling certain means that they are supposed to be more motivated they report higher motivation (also referred to sometimes as an “illusory correlation”; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To decrease this possibility, for the present study we did not include a measure of perceived control and certainty. Furthermore, we recognize that self-report measures can be subject to biases, such as social desirability, consistency motif, and acquiescent responding (Podsakoff et al., 2003). Thus, we replaced our self-report measure of motivation with three different measures of objective performance that are minimally influenced by introspection. As mentioned previously, we believe this technique can also attest to the real-world applicability of our findings. If we indeed find that the interaction between anxiety-inducing control threats and enemy-directed anger affects objective measures of motivation – an effect that cannot be explained by priming effects, lay theories, or self-report biases – that would serve as especially strong evidence for our model.

9. Study 3

9.1. Participants and procedure

The present study was conducted using a sample of 119 adult undergraduate students ($M_{\text{age}} = 18.94$, 62% female) at a large U.S. university. We employed a similar design to that of Study 1: Participants were randomly assigned to condition in a 2 (control threat: absent vs. present) \times 2 (enemy-directed anger: absent vs. present) between-subjects factorial design, with motivation as our outcome measure of interest. As in Study 1, A G*Power analysis (Faul et al., 2007) determined that a sample size of approximately 128 participants total (32 for each of the four experimental cells) would be adequate to obtain power of 0.80 to detect our hypothesized interactions at $\alpha = 0.05$. However, given the limitations of our participant pool (the number of participants enrolled and the number of participants who signed up), we were only able to recruit 30 participants per cell. We were originally able to collect 120 participants, but dropped one participant from the sample due to

the fact that this participant did not fully complete the study. We did not collect any additional data after analyzing the current data set. After exposure to the experimental manipulations, participants completed objective measures of performance.

9.2. Manipulations and measures

9.2.1. Control threat

Participants in the *control threat* condition read the same article and answered the same questions as in Study 1. Participants in the *baseline* condition read an article adapted from one that appeared in *The New York Times*. The article was about a pair of marine biologists exploring ocean life near the Pacific coast. It was presented to participants as a learning styles task in which researchers can gauge personality by examining how individuals learn from certain materials, such as newspaper articles. After finishing the article, participants were instructed to write three new things they learned or would like to learn related to the article.

9.2.2. Enemy-directed anger

Participants completed the same inductions (either no emotion or enemy-directed anger) as in Study 1.

9.2.3. Motivation

Motivation is often examined within the context of performance (LePine, LePine, & Jackson, 2004; Locke & Latham, 1990; Porter, Bigley, & Steers, 2003; Van Knippenberg, 2000). Such research has demonstrated that high motivation is reflected in high performance (Locke & Latham, 2004; Steers, Mowday, & Shapiro, 2004). Indeed, Colquitt and Chertkoff (2002, p. 592) explicitly state that “task motivation is a key determinant of performance on almost any task”. We drew on this prior work and assessed motivation behaviorally using two separate performance tasks and time spent on one of these tasks to capture underlying motivation (the tasks were presented in random order).

In one measure, participants were instructed to solve a series of anagrams by rearranging the letters of one word into another word (e.g., “rescue” into “secure”). Participants were given a set of 32 anagrams, all solvable, and could work for as long as they liked to solve the anagrams or give up at any point. There was more than one correct response per question, and the total number of correctly completed anagrams served as the performance measure (Schweitzer, Ordóñez, & Douma, 2004; Shah, Higgins, & Friedman, 1998). Given that there was no time limit on the anagram task (i.e., participants could work on the task as long as they liked), we used the time spent on the task as another measure of motivation. The underlying logic is that higher levels of performance and time spent is indicative of higher motivation.

The other measure was an analytical performance task that consisted of multiple-choice, GRE-style questions that each had one correct answer (Mrázek, Franklin, Phillips, Baird, & Schooler, 2013; Steele & Aronson, 1995). Participants were allotted 10 min to complete eight questions that tapped both math and verbal reasoning skill. An example question was “In a class of 78 students, 41 are taking French, 22 are taking German. Of the students taking French or German, 9 are taking both courses. How many students are not enrolled in either course?” (Christian & Ellis, 2011). There was only one correct response per question, and the total number of correct responses served as the performance measure. As these performance tasks were superficially unassociated with the control/emotion inductions, they would serve as a conservative test of our hypotheses. That is, if our manipulations impacted largely unrelated objective performance measures, this would again provide especially strong support for our predictions.

10. Study 3 results

See Table 5 for a summary of the means and standard deviations for all the following variables. See Table 6 for a correlation matrix of all variables. We did not include any covariates in any of our analyses.

10.1. Time spent on anagram task

In order to examine time spent on the anagram task, we submitted the data to a 2 (control threat: absent vs. present) \times 2 (enemy-directed anger: absent vs. present) ANOVA. In support for Hypothesis 2, the predicted crossover interaction was observed: $F(1, 114) = 4.91, p = 0.029, \eta^2 = 0.041$ (see Fig. 3). There was no main effect of enemy-directed anger, $F(1, 114) = 2.43, p = 0.122, \eta^2 = 0.021$, nor of control threat, $F(1, 114) = 0.42, p = 0.517, \eta^2 = 0.004$. Within the control threat condition, participants in the enemy-directed anger condition spent significantly more time on the task than participants in the no enemy-directed anger condition, $t(114) = 2.74, p = 0.007$, Cohen's $d = 0.74$, supporting Hypothesis 2a.

10.2. Anagram performance

We then analyzed the second objective measure of performance, the anagram task, using the same 2 \times 2 ANOVA. The predicted interaction was observed: $F(1, 114) = 4.20, p = 0.043, \eta^2 = 0.036$ (see Fig. 4), supporting Hypothesis 2. There was no main effect of enemy-directed anger, $F(1, 114) = 1.50, p = 0.223, \eta^2 = 0.013$, and no main effect of control threat, $F(1, 114) = 1.09, p = 0.299, \eta^2 = 0.009$. In the control threat condition, participants in the enemy-directed anger condition performed significantly better than participants in the no enemy-directed anger condition, $t(114) = 2.38, p = 0.019$, Cohen's $d = 0.66$. Once again, this supports Hypothesis 2a.

10.3. Analytical task performance

We performed the same ANOVA using performance on the analytical task as the dependent variable. The predicted interaction almost emerged: $F(1, 115) = 3.92, p = 0.050, \eta^2 = 0.033$ (see Fig. 5). There was no main effect of enemy-directed anger, $F(1, 115) = 0.43, p = 0.512, \eta^2 = 0.004$, nor of control threat, $F(1, 115) = 0.84, p = 0.362, \eta^2 = 0.007$. Within the control threat condition, participants in the enemy-directed anger condition performed better than participants in the no enemy-directed anger condition, $t(115) = 1.91, p = 0.059$, Cohen's $d = 0.52$, again supporting Hypothesis 2a.

11. Study 3 discussion

Overall, Study 3 provides strong support for our model (all effect sizes would be categorized as “medium-large” according to conventional standards; Cohen, 1969; Williams & Andrews, 2013). We demonstrate that when participants are given the opportunity to express anger after feeling anxious, their performance increases, indicative of heightened motivation. Furthermore, by using two types of performance measures – one with a time limit and one without – we increase the generalizability of our findings. Notably, we also diminish the possibility that certain methodological factors significantly biased our model.

12. General discussion

Drawing on appraisal theory and the avoidance-approach threat-defense model (Jonas et al., 2014), we hypothesized and found that enemy-directed anger following an anxiety-inducing control threat increases perceptions of control and certainty. This in turn boosts both objective and subjective indicators of motivation. Thus, we show that two negative emotions together, anxiety and anger, can elicit surprisingly strong positive effects. We provided evidence for our hypotheses across

Table 5
Means and standard deviations per condition among Study 3 variables^{a,b}.

| | Baseline | | Control threat | |
|-------------------------------------|----------------------|-------------------------|----------------------|-------------------------|
| | Enemy-directed anger | No enemy-directed anger | Enemy-directed anger | No enemy-directed anger |
| <i>n</i> | 25 | 32 | 35 | 27 |
| Anagram time ^c | 386.03 (196.31) | 412.33 (235.74) | 448.70 (244.85) | 297.69 (154.20) |
| Anagram performance ^d | 11.79 (8.30) | 12.97 (8.16) | 13.23 (7.43) | 8.56 (6.73) |
| Analytical performance ^e | 3.56 (2.20) | 4.00 (1.67) | 3.91 (1.79) | 3.04 (1.53) |

^a Total *n* = 119.
^b Standard deviations are shown in parentheses.
^c Measured in seconds.
^d Behavioral task with a minimum value of zero and a maximum value of 32.
^e Behavioral task with a minimum value of zero and a maximum value of eight.

three studies; this evidence is presented in overview in Table 7. First, we demonstrated that the interaction between an anxiety-inducing control threat and enemy-directed anger can have significant effects on reports of perceived control and certainty and motivation. Second, we provided insight into underlying mechanisms by revealing that the interactive effect of threat and enemyship on motivation occurs via a corresponding increase in control and certainty perceptions. Third, we thoroughly tested our theoretical propositions by pinpointing the exact phenomenon underlying our findings. We found that after a control threat it is indeed the dual experience of anger and the presence of a relevant enemy figure that increases perceptions of control and certainty, and not just the isolated experience of anger or the mere salience of an enemy. Fourth, we tested the strength and applicability of our model using objective measures not susceptible to biases sometimes associated with introspective measures (Podsakoff et al., 2003). Our findings provide convergent evidence, across both students and adults, behavioral tasks and self-report measures, that the specific progression from anxiety to anger increases perceptions of control and certainty and hence, motivation.

12.1. Implications

We demonstrate that emotions play a critical role in the control-maintenance function of enemyship. That is, just considering the cognitive salience of an enemy following a control threat paints an incomplete picture of the underlying processes. Emotion, particularly anger, plays several important roles. We propose that the identification of an enemy following a control threat is often accompanied by anger. The feeling of anger along with the identification of an enemy then increases one's sense of control and certainty (Smith & Ellsworth, 1985). This calls for a reinterpretation of past research examining the socio-cognitive functions of enemyship (e.g., Sullivan et al., 2010). Though our work does not contradict such research, we feel that by failing to account for the role of anger, scholars have overlooked a significant portion of the variance in models predicting control and certainty. That is to say, we urge future researchers to consider the role of emotion when investigating interpersonal enemyship.

Our methodology also advances our understanding of these phenomena above other work examining main effects and correlational designs (Jonas et al., 2014). While many scholars working on threat and

Table 6
Descriptive statistics and correlations among variables in Study 3.

| Variable | <i>M</i> | <i>SD</i> | 1. | 2. | 3. | 4. | 5. |
|---------------------------|----------|-----------|-------|-------|-------|------|----|
| 1. Anagram time | 391.54 | 219.41 | – | | | | |
| 2. Anagram performance | 11.80 | 7.79 | 0.72* | – | | | |
| 3. Analytical performance | 3.66 | 1.82 | 0.33* | 0.38* | – | | |
| 4. Gender | 0.63 | 0.49 | 0.14 | 0.13 | –0.16 | – | |
| 5. Age | 18.98 | 1.61 | –0.02 | –0.07 | 0.05 | 0.01 | – |

^a Total *n* = 119.
 Gender coded as 0 = Male, 1 = Female.
 * *p* < 0.01.

defense processes have posited an avoidance-approach temporal sequence, we independently manipulated the experience of avoidance-oriented affect (through a control threat that induced anxiety) and subsequent approach orientation in order to examine their interactive impact. In our studies anger plays a unique role in activating an approach orientation. It provides a burst of energy required to “attack” the perceived transgressor, usually through confrontation, retaliation, revenge, or aggression (Anderson & Bushman, 2002). Thus, we contribute to the broad theory of threat-defense dynamics. We provide empirical evidence that individuals initially respond to control threats with anxiety (associated with an avoidance motivation), but then shift to anger (associated with an approach motivation) after given an opportunity to defend against the threat (in this case, by identifying a focal enemy). Future studies in the threat-defense literature should apply this moderation approach in broader ways when examining interpersonal enemyship.

We also extend previous work by examining a downstream effect of control threats. Namely, we look at how such threats influence not only perceptions of control and certainty, but also actual behavior. In doing so, our findings contribute to compensatory control theory (Kay & Eibach, 2013), which asserts that people respond to threats to personal control with compensatory strategies intended to increase control, such as bolstering personal agency (Kay, Gaucher, Napier, Callan, & Laurin, 2008). In a recent meta-analysis on compensatory control theory (Landau et al., 2015), the theoretical model stopped at the use of different strategies (i.e., after reduced perceptions of control, individuals engage one of four compensatory strategies). While such research has extensively examined how compensatory strategies influence self-reports of control and sometimes motivation, little work has been done on how these strategies subsequently influence objective behaviors. By examining impartial measures of motivation our study is one of the first to test whether we actually see threatened individuals *behave* in a way consistent with compensatory control strategies. Our findings show that indeed they do, thereby further contributing to the wide predictive capabilities of compensatory control theory.

In line with expectancy theory, perceptions of control and certainty are partially the foundation for heightened motivation. Accordingly, future research could investigate whether our findings generalize to other such behaviors. According to our results, a control threat followed by

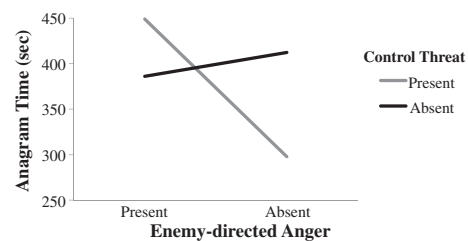


Fig. 3. Interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. present) on time spent on the anagram task (in seconds) in Study 3. No time limit was imposed.

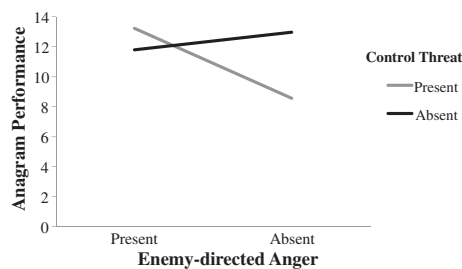


Fig. 4. Interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. present) on anagram performance in Study 3. The minimum possible score was zero correct, and the maximum possible score was 32 correct out of 32.

enemy-directed anger would likely affect other behaviors which also increase as a function of high perceptions of control and certainty. For instance, risk-seeking behavior is observed much more frequently when individuals perceive control and certainty over the situation, as they sense a lower probability of losing a gamble (Gino & Margolis, 2011; McDaniels, Axelrod, Cavanagh, & Slovic, 1997). Thus, any risky behaviors, such as drug use (Horvath & Zuckerman, 1993) or financial investing (Wärneryd, 1996), could increase along with perceptions of control and certainty following an anxiety-inducing control threat.

Another potential contribution of the present studies is that anger does not always lead to purely negative outcomes, as some studies might suggest (see Anderson & Bushman, 2002). Past research has tended to focus on the damaging effects of anger with regard to variables like riskiness, interpersonal aggression, counterproductive work behaviors, and unethical decision-making (Fox & Spector, 1999; Kligyte, Connelly, Thiel, & Devenport, 2013; Lerner & Keltner, 2001). However, a nascent area of research is exploring the less harmful side of anger (Friedman et al., 2004; Sinaceur & Tiedens, 2006; Tagar, Federico, & Halperin, 2011). Consider Tagar et al., who showed that under certain conditions, anger can actually decrease protracted conflict. Our results demonstrate that anger at an enemy following a control threat actually increases perceptions of control and certainty and motivation, reinforcing the idea that anger is not always detrimental.

The present studies also attest to the temporal, dynamic nature of emotional experience. It is not sufficient to examine the discrete impact that an emotion, such as anxiety, can yield on dependent variables; researchers should also consider the specific way in which these feelings develop over time. We echo previous research (e.g., Bledow, Rosing, & Frese, 2013) in highlighting the importance of the temporal dimension. However, our studies go beyond tracking the progression of a variable over time. Instead, they specifically demonstrate how external changes in the individual's experience can drastically change the impact of a variable over time. In this case, the subsequent experience of anger at an enemy reverses the otherwise intuitive negative effects that anxiety provoking control threats have on perceptions of control and certainty and motivation.

One important implication of our results is that individuals and groups may often draw on the control-restorative function of enemy-

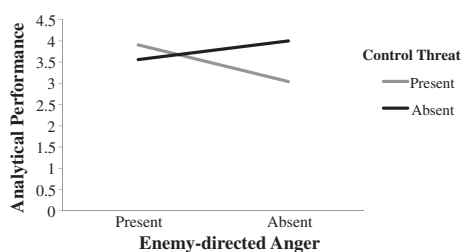


Fig. 5. Interaction between control threat (absent vs. present) and enemy-directed anger (absent vs. present) on analytical performance in Study 3. The minimum possible score was zero correct, and the maximum possible score was eight correct out of eight.

directed anger by scapegoating undeserving targets during times of social uncertainty. In short, there could be a psychological “tragedy of the commons” when it comes to interpersonal enmity. Any given individual may derive some psychological benefit from venting anger at an enemy during, say, a period of economic crisis. But society as a whole certainly suffers from such processes, which can quickly scale up to intergroup prejudice and acts of violence. This phenomenon has been well documented in the literature (e.g., Rothschild et al., 2012; Staub, 1989), and in this connection our current work illuminates the detailed cognitive-emotional dynamics of such scapegoating behavior. However, it is critical that the lessons of this research not be forgotten. Researchers and applied workers in the areas of intergroup and interpersonal conflict should bear in mind that individuals have strong psychological incentives to identify enemies when confronted by anxious uncertainty. To avoid undue and potentially violent scapegoating, it is vital that future research investigate alternative means for increasing control and motivation in the wake of threat.

12.2. Limitations and future directions

Our studies are certainly not without limitations. For instance, the effect sizes and *p*-values associated with our overarching interaction hypothesis were not as strong as they could be, indicating that the interaction between control threats and enemy-directed anger accounts for a small portion of the variance in perceptions of control and certainty and motivation (although they are somewhat comparable to other studies; Major et al., 2016). Some of the key comparisons appeared to be stronger. For example, within the control threat condition in Study 2 perceptions of control and certainty in the enemy-directed anger condition were significantly higher than those in the absent condition, the only anger condition, and the only enemy condition, all at $p < 0.01$. We find this to be both counterintuitive and interesting, especially because it decouples enemy-directed anger from mere feelings of anger and the mere presence of an enemy. Although our effect sizes are somewhat inconsistent, we nevertheless find the overall pattern across the studies to be quite compelling. These are theoretically specified interaction patterns using relatively artificial (e.g., written prompt) manipulations. We believe they demonstrate – under contexts of high experimental control – causal processes that could almost certainly be amplified in comparable real-world scenarios.

Another possible limitation is that although the specific operationalizations differed, we used generally similar induction procedures in all three studies. That is, each manipulation involved introspection at the personal level regarding how the individual feels about a particular topic. Future research using other emotion induction techniques would certainly strengthen the results presented here. For instance, Lobbetael, Arntz, and Wiers (2008) compared four different anger-induction techniques in the lab and showed that unjustified harassment strikingly increased cardiovascular activity and self-reports of anger. Testing whether higher levels of anger (induced through a more potent method) that follow a control threat correspond with greater perceptions of control and certainty and motivation would help signify whether the relationship among these variables is robust across experimental procedures, and perhaps even whether the relationships are linear or curvilinear. We would expect that given we observed the predicted effects using introspective manipulations, our results would only be strengthened through the use of more immersive inductions.

Future research could consider how factors such as personality traits, cultural norms, and individual backgrounds interact with affective experiences to influence subsequent behavior, in addition to emotional experiences. For example, one potential moderator of the relationship between control threat and perceptions of control and certainty is emotional intelligence, which is the capacity to process emotional information accurately and efficiently (Mayer & Salovey, 1995). A review of the literature indicates that individuals high in emotional intelligence show

Table 7
Comparison of hypotheses across the three studies.

| | Study 1 | Study 2 | Study 3 |
|---------------|--|--|------------------------|
| Hypothesis 1 | Supported $p = 0.010$ $\eta^2 = 0.042$ | Supported $p = 0.026$ $\eta^2 = 0.023$ | Not tested |
| Hypothesis 1a | Supported $p = 0.039$ Cohen's $d = 0.46$ | Supported $p = 0.002$ Cohen's $d = 0.67$ | Not tested |
| Hypothesis 2 | Supported $p = 0.042$ $\eta^2 = 0.027$ | Supported $p = 0.021$ $\eta^2 = 0.025$ | Time on anagram task |
| | | | Anagram performance |
| | | | Analytical performance |
| Hypothesis 2a | Not Supported $p = 0.135$ | Supported $p = 0.004$ Cohen's $d = 0.71$ | Time on anagram task |
| | | | Anagram performance |
| | | | Analytical performance |
| Hypothesis 3 | Supported | Supported | Time on anagram task |
| | | | Anagram performance |
| | | | Analytical performance |

healthier reactions in response to adverse situations. For instance, emotionally intelligent individuals showed more resilience after a negative mood induction (Schutte, Malouff, Simunek, McKenley, & Hollander, 2002). In addition, Schutte, Schuettpelez, and Malouff (2001) found that participants high in emotional intelligence solved more anagrams in both calming and frustrating situations than did participants low in emotional intelligence. The evidence thus suggests that high emotional intelligence might also serve as a buffer by mitigating the undesirable consequences of control threats on anger, perceptions of control and certainty, and motivation.

On the other hand, it is possible that other personality factors could increase the likelihood that certain individuals might seek out clear enemies as a response to the threat of uncertainty. For instance, Sullivan et al. (2010) found in one study that individuals low in dispositional internal locus of control were especially likely to perceive themselves as having powerful enemies when confronted with a control threat. A related possibility is that people high in need for affect (Maio & Esses, 2001) may benefit especially from experiencing anger in the aftermath of anxiety. Furthermore, it would be important to determine whether such behavior depends on the gender. Are men more likely to seek out enemies than women? Based on evolutionary factors (Cialdini & Trost, 1998), we are inclined to associate men with aggression, dominance, and power, while we tend to associate women with kindness, caring, and friendliness (frequently referred to as the motivation to “tend and befriend”; Taylor et al., 2000). The aggression of men is often considered critical to obtaining limited resources and protecting loved ones from harm. Therefore, it stands to reason that men would be more likely than women to seek out, aggress towards, and neutralize potentially dangerous enemies.

Another direction for future research would be investigating whether an enemy must be perceived as surmountable or vulnerable in order for anger to serve a control-restorative function. Our theoretical perspective assumes that the transition from perceiving the world as random and chaotic to navigable via the identification of a human enemy occurs because human enemies are perceived as relatively more surmountable than chaotic forces. In the current studies, we did not explicitly compare the psychological experience of perceiving a surmountable versus an insurmountable enemy. At least some of the enemy figures used in our operationalizations – such as a U.S. Senator (Studies 1 & 3) – were probably perceived as relatively impervious to any actions that could be taken by our participants. Nevertheless, participants may have felt that they have some power over Senators, who are dependent on voting patterns of the people.

Hence the question remains as to whether being confronted with the image of a truly insurmountable enemy would have the same

control-restorative effects observed in our studies. Would a person living in a military dictatorship feel a sense of control if they were reminded of their dictator? While current data cannot definitively resolve this issue, two prior observations suggest that even insurmountable enemies might sometimes serve a control-restorative function. First, Sullivan et al. (2010) found that being confronted with a mysteriously powerful enemy actually boosted perceived control after threat more than being confronted with an enemy who was weak and easily defeated. Second, such effects may occur because of a more general principle that has been empirically documented (Landau et al., 2015) – that people can experience a boost to perceived control when they perceive any structure in the universe, even if that structure is negatively valenced. This observation is related to findings from system justification theory. It is possible that a person living in a dictatorship would experience more perceived control if they could attribute their sufferings to a dictator rather than to caprice.

With these observations in mind, it is still critical to recall that the novel contribution of the current studies is an application of precepts from appraisal theory – namely, showing that the certain emotion of anger is critical for an enemy's control-restorative effect. Thus, the key factor may not be whether an enemy is perceived as insurmountable or not, but whether they inspire anger (or some other certain emotion) or fear (or some other uncertain emotion).

In this connection, we believe it would be worthwhile to explore the effects of other emotions on motivation in order to create a more comprehensive classification scheme. Different subsets of emotions following different affective experiences may yield various effects on perceptions of control and certainty and motivation. Identifying which emotions most strongly influence motivation would be a foundational building block in contributing to a theory of work motivation. For example, according to appraisal theory, experiencing an episode of intense fear after anxiety is likely to exacerbate already decreased levels of perceptions of control and certainty because fear is characterized by uncertainty (Lerner & Keltner, 2001; Smith & Ellsworth, 1985; Tiedens & Linton, 2001). This would probably result in especially low levels of motivation. It would also be interesting to examine the effects of positive emotions, such as an episode of pride, following a control threat, which could address whether emotional experiences that differ in valence can also alter ensuing behaviors.

13. Conclusion

In the present paper, we drew upon appraisal theory and showed that the dual experience of two different negative emotions can sometimes culminate in positive outcomes. Across three studies we

demonstrated that the opportunity to experience anger towards a relevant enemy figure (compared to no such opportunity) following an anxiety-inducing control threat increases perceptions of control, certainty, and motivation. These results held across different samples and manipulations. Working within an avoidance–approach temporal framework, we hope to illustrate the importance of dynamic emotional experiences, and how anger can serve a functional role in the process of enemyship.

Appendix A. Supplementary Materials

Supplementary Materials to this article can be found online at <http://dx.doi.org/10.1016/j.jesp.2016.07.007>.

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