Self and Identity, 2007, Vol. 6, Issue 2, pp. 223 - 237, https://doi.org/10.1080/15298860601115351.

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Self and Identity
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713685324

The mask of zeal: Low implicit self-esteem, threat, and defensive extremism

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The Mask of Zeal: Low Implicit Self-esteem, Threat, and Defensive Extremism

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Theorists have long proposed that vulnerable people turn to zeal in the face of perceived self-threats because doing so somehow masks the threats. The present study supports this idea, and suggests that low implicit self-esteem may be a key vulnerability that predisposes individuals toward defensive zeal. Undergraduate participants with low implicit self-esteem, as assessed by an Internet version of the Implicit Association Test, reacted to an experimentally manipulated academic threat with zeal about their opinions toward capital punishment, the US invasion of Iraq, and suicide bombing. Significant effects were found for two aspects of zeal—extremism and exaggerated estimates of social consensus for personal opinions. Results for each issue were independent of whether participants were in favor of, or against the issue.

> The uncompromising attitude is more indicative of an inner uncertainty than of deep conviction. (Eric Hoffer, 1954, p. 41)

Crusades and inquisitions may be what first come to mind when one thinks about the dark side of zeal, but even today zeal seems to fuel wars and massacres with grim regularity. This article investigates the idea that expressing zeal helps people with low implicit self-esteem cope with inner troubles. We use the term zeal to refer to extremism and exaggerated conviction and consensus estimates for personal opinions.

Pioneering theorists promoted the idea that vulnerable people use zeal to mask disturbing thoughts. William James (1902/1958) concluded that for sick souls, ''religious rapture, moral enthusiasm, ontological wonder, and cosmic emotion, are all unifying states of mind, in which the sand and grit of self-hood incline to disappear'' (p. 240). Three years later, Freud claimed that neurotic individuals mask disturbing thoughts by seizing on ''supervalent,'' ''reactive'' thoughts with a ''surplus

of intensity'' (Gay, 1989, p. 200). He went on to say that such extreme thoughts form ''mental dams'' to keep unwanted thoughts at bay (pp. 261–262). Consistent with these seminal ideas, Pavlov (1927) and Lewin (1933, 1935) observed that aversive conflicts caused extreme and obdurate reactions in dogs and toddlers, respectively. Lewin argued that when reality is intolerable, flight to single-minded and fantastical ideas can help exclude disturbing thoughts from the mental field. This theme of zealous escapism was foundational for early explanations of the origins of the zealous worldviews and prejudices that were prevalent during World War II. Specifically, Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) and Fromm (1941) concluded that internalized childhood experiences of shame and uncertainty grow into closed-minded authoritarianism and fascism (cf. Jost, Glaser, Kruglanski, & Sulloway, 2003, for recent evidence of the link between vulnerability and closed-mindedness). The themes shared by these psychodynamically rooted ideas are that: (a) situational threats cause zeal; (b) zeal helps mask self-threatening information; and (c) threat is most likely to induce zeal among people with vulnerable self-concepts. In the following sections, we review research that probes these three ideas, and present the results of an experiment that investigates the role of low implicit self-esteem as a key risk factor for zeal.

Do Self-threats Cause Compensatory Zeal?

McGregor and his colleagues have repeatedly found that self-threats cause individuals to exaggerate aspects of zeal. In one study, being reminded of troubling personal dilemmas caused participants to exaggerate conviction for their value-laden opinions (McGregor et al., 2001, Study 1). Specifically, participants who were randomly assigned to grapple with their personal uncertainties about relationships or career paths reacted by claiming exaggerated conviction and social consensus for their attitudes about capital punishment and abortion. Personal uncertainty in one domain thus seemed to motivate exaggerated certainty and zeal in unrelated domains.

In a related study, the same dilemma-uncertainty manipulation caused participants to bolster zeal for their life values and passion for their current goals (McGregor, Zanna, Holmes, & Spencer, 2001, Study 2). After being reminded of their personal dilemmas, participants heightened the importance of their core value priorities and the meaningfulness of their top ten personal projects. For example, they rated projects like, ''be nicer to my mother,'' ''get As in all my courses,'' and even ''walk the dog every day'' as higher in value congruence and importance to their self-identity. In other studies the same dilemma-uncertainty manipulation has also caused some Canadians to become less tolerant of Islam (Haji & McGregor, 2002), and to answer questions about their own character more decisively (i.e., they made faster me-not-me decisions about character traits; McGregor & Marigold, 2003, Study 1). Together, these studies demonstrate that thinking about personal problems can motivate compensatory zeal about opinions, values, goals, and identity.

Other forms of psychological distress have had similar effects. In one study a classic, induced-compliance cognitive dissonance manipulation caused some participants to become zealous about unrelated opinions (McGregor & Crippen, 2003). Specifically, after being subtly coerced to write in support of an offensive academic policy, some undergraduates reacted by exaggerating their estimates of social consensus for their personal opinions on capital punishment and

abortion. Even after seeing a list of ten diverse, common opinions across the ideological spectrum for each issue, dissonance-threatened participants still lunged toward consensus and estimated that 66% of all people would agree with their opinions.

Similar compensatory zeal reactions have also followed threats to system-justice beliefs and personal meanings. In one study, participants in the Southern USA were exposed to information about the Enron corporate scandal that took place in Texas, where corporate executives swindled average investors out of millions of dollars, with seemingly minimal repercussions. This threat to participants' faith in the American corporate and justice systems caused them to react with exaggerated preference for an author who praised broad American values over one who criticized them (McGregor, Nail, Marigold, & Kang, 2005, Study 3). In another study, reflecting on the transience of cherished personal memories caused individuals to heighten their desire to find meaning in their lives. It also caused zeal about personal values, exaggerated personal project meaningfulness, and exaggerated preference for an author who upheld their lifestyle norms over an author who criticized their lifestyle norms (McGregor et al., 2001).

There is thus substantial evidence that epistemic threats related to personal dilemmas, cognitive inconsistency, and disruptions in meaning can motivate compensatory zeal. Zeal in response to threat, however, is not limited to such epistemic threats. Experiences that reflect negatively on self-worth also seem to motivate zeal. One study recently found that failure on a difficult statistics exercise caused exaggerated zeal (McGregor et al., 2005, Study 1). Undergraduate psychology majors in the threat condition were required to summarize a passage about structural equation modeling from a graduate statistics text. The passage was loaded with Greek symbols and bewildering mathematical formulae. This statistics-failure manipulation not only decreased implicit self-esteem on a shortened version of the Implicit Association Test (IAT; adapted from Greenwald & Farnham, 2000), it also caused exaggerated consensus estimates for opinions about capital punishment and abortion. Another study found that even just reflecting on past failures can cause zealous reactions. In this study, Haji and McGregor (2002) found that writing about past academic or vocational failures amplified disdain for Islam.

There is also evidence that, like epistemic and esteem threats, relationship threats can cause the same kinds of zeal reactions. An imagery exercise that required participants to imagine moving to an inhospitable foreign country, cut off from contact with loved ones, caused some participants to claim exaggerated consensus for their opinions about capital punishment and abortion (McGregor et al., 2005, Study 2). Reflecting on real-life relationship problems also caused zeal reactions in another study. Some participants wrote about a personal relationship that was not going well, and was at risk of dissolution. Compared to participants who instead wrote about someone else's relationship problems, those who described their own distressed relationships reacted with exaggerated conviction for their views on capital punishment and abortion (McGregor & Marigold, 2003, Study 3).

Finally, reflecting on one's own mortality can motivate personal zeal. In two studies, instructions to write about the disturbing topic of personal death and body decay caused some participants to exaggerate perceptions of the meaningfulness of their personal projects and self-identifications (McGregor & Gailliot, 2006, Study 2; McGregor et al., 2001, Study 4). Together, these results provide solid evidence for the conclusion that self-threats—whether epistemic, esteem, relationship, or mortality related—can motivate reactive zeal.

Does Zeal Mask Self-threats?

Why do people react to threats with zeal? One possibility is that focusing on exaggerated conviction can somehow make threats in other domains seem less urgent. In other words, zealous thoughts might help insulate people from concern with threatening thoughts. This possibility is consistent with the previously mentioned claims of James and Freud, who proposed that zeal helps mask troubling thoughts. To test this idea, McGregor and his colleagues conducted five experiments to assess the effects of zeal on the subjective salience of participants' unrelated personal uncertainties. Subjective salience refers to the extent to which participants rate threatening experiences as feeling big, urgent, pressing, significant, and difficult to ignore. In all five experiments, participants first wrote about threatening personal uncertainties (which have caused distress and defensiveness in past research; e.g., McGregor et al., 2001). Some participants were then given the opportunity to express personal zeal about specified unrelated topics. In all five experiments, expressing zeal related to opinions, values, successes, loves, or group-identifications significantly decreased the subjective salience of threatening personal uncertainties that had been written about at the beginning of the experimental session (McGregor, 2004a; McGregor, 2006; McGregor & Marigold, 2003, Study 4; McGregor et al., 2005, Study 4). Moreover, in another study, after a threat, the intensity of participants' spontaneous zeal correlated negatively with subsequently assessed subjective salience of the threat topic (McGregor, 2004b). In five of the six studies, the apparent threat-masking effects of zeal emerged only among participants with defensive personality tendencies, and were not apparent in no-threat control conditions. These results converge on the conclusion that motivated, reactive zeal can mask unrelated self-threats.

How does zeal mask threat? Intriguingly, counter to early speculation (McGregor, Newby-Clark, & Zanna, 1999) distraction does *not* seem to be the mechanism. Evidence from several studies now indicates that even after repeated reminders of the threatening information, the salience reducing effect of zeal persists (McGregor, 2006; McGregor & Crippen, 2003). An alternative possibility is that the benefits of zeal derive from the principles of "regulatory fit." Higgins and colleagues have shown that when information matches an individual's regulatory focus, it looms larger than when it mis-matches (Higgins, 2005). For example, messages that emphasize threat resonate particularly strongly for individuals with a state or trait tendency to focus on vigilant prevention of undesirable outcomes. In contrast, individuals who tend to focus on eager promotion of desirable outcomes are relatively oblivious to threat-framed messages. They are more motivationally focused on approaching ideals than avoiding threats. Accordingly, we are currently investigating the idea that, in the face of threat, people turn to eager preoccupation with zealous ideals because doing so initiates a promotion-focused state that down-regulates vigilant prevention-focus on threats. This possibility seems promising because zeal is idealistic and ideals are central to promotion focus (Higgins, Roney, Crowe, & Hymes, 1994). Moreover, recent evidence suggests that there is a reciprocal inhibition of activity in brain regions that specialize in promotion and prevention focus (Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004; see McGregor, in press, for a more in-depth account of the regulatory mis-fit idea and for a review of literature related to possible neuropsychological substrates). Thus, zeal may render threats less subjectively salient by shifting motivational emphasis toward eager promotion of the zealous ideal, and away from vigilant preoccupation with the threat.

Low Implicit Self-esteem and Zeal

Evidence reviewed to this point indicates that threats do cause zeal and that zeal does mask threats. But the classic theorists also suggested that "sick souls" with vulnerable selves should be particularly inclined to seek solace in defensive zeal. Low implicit self-esteem may be a particularly relevant vulnerability in the face of self-threat because it specifically reflects *experiential* associations of the self with negative affect (Conner & Barrett, 2005; Robinson & Meier, 2005; Rudman, 2004). Moreover, these negative associations are especially prominent under conditions of self-focus (Cheng, Govorun, & Chartrand, 2006), which is induced by self-threat and negative affect (Greenberg & Pyszczynski, 1986; Mor & Winquist, 2002; Wood, Saltzberg, Neale, Stone, & Rachmiel, 1990). Accordingly, in two of the studies reported above, in which implicit self-esteem was assessed, significant two-way interactions revealed highest zeal about opinions among *low* implicit self-esteem participants in the threat conditions (McGregor & Marigold, 2003, Study 3; McGregor et al., 2005, Study 1). Implicit self-esteem in those studies was assessed with a version of the IAT, which assesses the relative strength of associations between the self and positive versus negative affect (following Greenwald & Farnham, 2000; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003b). As such, this implicit measure was particularly well suited for assessing vulnerabilities relating to negative experiential self-associations, which may not be foremost in conscious awareness (and thus, which map onto classic psychodynamic theories).

Indeed, in both of the studies described above, in which significant implicit self-esteem by threat interaction effects on zeal were found, conventional questionnaire measures of explicit self-esteem were not correlated with implicit self-esteem. Moreover, whereas in both studies, threats caused the most zeal among participants with *low implicit* self-esteem, equally significant two-way interactions also showed that threats caused most zeal among participants with *high explicit* self-esteem. In those studies, the three-way interaction was also significant, with highest zeal observed among threatened participants possessing both low implicit and high explicit self-esteem. Ongoing theory and research is currently probing how various measures of implicit self-esteem interact with explicit self-esteem to produce different types of defensiveness (e.g., Bosson, Brown, Zeigler-Hill, & Swann, 2003; Jordan, Spencer, & Zanna, 2003a; Jordan, Spencer, & Zanna, 2005; McGregor & Marigold, 2003; McGregor et al., 2005; Ziegler-Hill, 2006). What is clear so far and of particular relevance to the present research, however, is that experimentally manipulated self-threats have reliably caused exaggerated zeal about value-laden opinions among individuals with low implicit (but not explicit) self-esteem.

The Present Experiment

The present research extends these past findings in two ways. First, it investigates whether the defensive zeal of threatened participants with low implicit self-esteem will extend to opinions about incendiary topics, such as suicide bombing and the US invasion of Iraq. Second, it provides an important extension of past defensive zeal by assessing defensive extremism for the first time. Extremism is assessed along with exaggerated consensus, which is a well-established facet of defensive zeal. One might expect that as opinion extremity increases, consensus estimates should decrease as the opinion-holder recognizes that he or she is on the fringe of credibility. Classic theorizing on defensiveness and everyday observation seem to indicate, however,

that extremism and delusional confidence sometimes co-occur. The present study probes this frightening co-occurrence, and is the first to assess defensive extremism and exaggerated consensus estimates for opinions together in the same study.

After completing the implicit self-esteem measure, participants were randomly assigned to a self-threat or a control condition. For the dependent measures, participants viewed a list of diverse statements about capital punishment, the recent war in Iraq, and suicide bombing, that varied in extremity for or against each issue. After circling the one statement about each issue that came closest to their own opinion, they estimated social consensus for that statement. We expected that participants with low implicit self-esteem in the self-threat condition would endorse the most extreme opinions and also provide the most exaggerated estimates of social consensus for them.

Method

Participants and Procedure

Data were collected over the Internet from 23 undergraduate students (15 female, 3 male, 5 unspecified) who participated in exchange for course credit. Participants completed the materials at their convenience, with no laboratory personnel present. The study was described to participants in an on-line consent form, but participants did not record their names or any other identifying information at any time. To indicate their consent, they simply pressed a button to continue with the study, with the understanding that they could quit at any time. As in past compensatory zeal research, the assessment of implicit self-esteem was embedded in a packet of questionnaires at the beginning of the study. After the threat manipulation, participants completed a few additional questionnaires and then the dependent variable that assessed extremity and consensus estimates for their opinions about social issues.

Implicit Self-esteem

We used a modified version of the IAT to assess implicit self-esteem (following Jordan et al., 2003b; Jordan et al., 2005; McGregor & Marigold, 2003; McGregor et al., 2005). To streamline the IAT for web administration, we shortened the number of trials from 40 to 36 in each block, and eliminated two of the practice trial blocks. As in our past research, a neutral category (i.e., ''object'') was used to oppose the ''self'' category in this IAT, rather than the category of ''other'' (see Jordan et al., 2003b; Jordan et al., 2005). This was done to remove the influence of attitudes toward others in the IAT measurement and ensure it is strictly a measure of implicit self-esteem (see Karpinski, 2004, for further discussion of this issue). Also, to avoid using a negated category, the labels ''self'' and ''object'' were used, rather than the ''self'' and ''not-self'' labels that we have used in some of our past research. Sample stimuli for the pleasant and unpleasant words were sunshine, gift, smile, joy, garbage, vomit, cockroach, and evil. Stimuli for the self and object words were me, myself, it, and that. In the ''consistent'' critical block of trials, participants categorized 36 stimulus words as either self/pleasant or object/unpleasant. In the ''inconsistent'' critical block of trials, participants categorized the same stimulus words as either self/unpleasant or object/pleasant. We computed implicit self-esteem scores by subtracting the average response latency to the consistent categorizations from the average response

latency to the inconsistent categorizations. Thus, as usual, the implicit self-esteem scores reflected how much more easily participants could work with the pairing of self/pleasant categories than self/unpleasant categories. Following Greenwald and Farnham (2000), we recoded response latencies longer than 3000 ms as 3000 ms and those shorter than 300 ms as 300 ms. The latencies of incorrect responses were not included in the average latency scores. No participant had more than a 20% error rate and so all data were retained for analyses.[1]

Threat Manipulation

Participants in the threat condition read and summarized an extremely difficult statistics passage about LISREL that was taken (out of context) from a graduate statistics textbook. The instructions were as follows:

> The passage below is from an introduction to a statistical procedure called Linear Structural Relations, or LISREL. LISREL is a tool for analyzing causal relations among psychological variables. We are interested in assessing how understandable it is to you. Please take five minutes to read the passage below, and then summarize it as best you can.

The passage (taken from Pedhazur, 1982, pp. 639–640) read:

> The measurement model specifies the relations between unobserved and observed, or latent and manifest, variables. Two equations describe this model: $\mathbf{y} = \Lambda_{\mathbf{y}}\mathbf{n} + \epsilon$ Where $\mathbf{y}$ is a p by 1 vector of measures of dependent variables; Λ (lambda) is a p by m matrix of coefficients, or loadings, of $\mathbf{y}$ on the unobserved dependent variables ($\boldsymbol{n}$); ϵ (epsilon) is a p by 1 vector of errors of measurement of $\mathbf{y} \cdot \mathrm{x} = \Lambda_{\mathbf{r}}\xi + \delta$ Where x is a q by 1 vector of measures of independent variables; Λ (lambda) is a q by n matrix of coefficients, or loadings, of $\times$ on the unobserved independent variables (ξ); and δ (delta) is a q by 1 vector of errors of measurement of x. . . .

In previous research, this manipulation decreased implicit self-esteem[2] and caused exaggerated consensus estimates for opinions about capital punishment and abortion among individuals with low implicit self-esteem (McGregor, et al., 2005, Study 1). In this previous work, participants in the control condition summarized a simple and easy passage about the usefulness of statistics. In the present study, instead, they completed a more clearly negative exercise that involved writing about the experience of dental pain (which is frequently used as a control condition exercise in research on reactions to mortality salience; Greenberg, Solomon, & Pyszczynski, 1997). We did not expect the dental pain materials to cause zeal, because although dental pain is aversive it does not pose any obvious threat to the self-concept and writing about it has not caused self-righteous zeal in past research (McGregor, in press).

Zeal: Extremism and Exaggerated Consensus Estimates

Past compensatory conviction research has relied on assessing opinions about capital punishment and abortion issues (McGregor & Marigold, 2003; McGregor et al., 2001, 2005). We kept the capital punishment issue in the present research, but to expand generalizability we replaced the abortion issue with two highly charged social issues of current international relevance. Participants thus read lists of eleven diverse opinions about capital punishment, the recent invasion of Iraq by the United States, and suicide bombing.

The opinion statements that participants could choose from ranged evenly across the ideological spectrum, covering opinions that were mildly to extremely in favor of each topic and mildly to extremely against each topic. Across the three topics, 16 of the statements were critical, and 17 favorable. Extremity was also balanced, with 10 of the statements expressing mild opinions, 12 expressing moderate opinions, and 11 expressing extreme opinions. Two independent raters also rated the favorability of each of the 33 provided opinions from -3 (*extremely unfavorable*) to -1 (*mildly unfavorable*) or $+3$ (*extremely favorable*) to $+1$ (*mildly favorable*). The two sets of ratings correlated at $r = .95$, and were averaged to yield a favorability rating for each opinion statement. Each opinion statement was then translated into an extremity rating (from 1 to 3), by taking the absolute value of the favorability rating. Participants' overall extremity scores were computed by averaging the extremity ratings of the opinions they endorsed for the three issues (capital punishment, Iraq, and suicide bombing). Among the statements that we coded as extreme were: "A murderer deserves to die"; "Capital punishment is absolutely never justified"; "The US did the right thing. Iraq was a menace and had it coming"; "George Bush is a dangerous maniac"; "Suicide bombing is one of the most horrible and despicable acts imaginable"; and "Suicide bombers' courage and willingness to die for what they believe shows a lot of integrity."

For each issue, participants selected the one opinion they most agreed with from the list of eleven, and then: (a) rated the percentage of people who they thought would *agree* with their selected opinion; and (b) rated the percentage who they thought would *agree most* with their selected opinion. We averaged participants' six consensus ratings across the three issues to create an overall measure of perceived social consensus for social issue opinions.

Finally, we standardized and averaged participants' overall consensus and extremity scores to create an overall index of zeal, which served as our main dependent variable (alpha = .62).

Results

As shown in Table 1, participants endorsed opinions that were, on average, mildly critical of capital punishment, the US invasion of Iraq, and suicide bombing. The same table shows that, on average, participants endorsed moderately extreme positions, for which they estimated around 60% social consensus. Overall extremity and consensus scores were significantly correlated, $r(22) = .45$, $p < .05$.

For the main analysis, we regressed participants' overall zeal scores onto implicit self-esteem (centered), threat (effect coded) and the implicit self-esteem $\times$ threat interaction. Results of this analysis revealed a significant interaction between implicit self-esteem and threat, $t(19) = 2.89$, $p < .01$. As show in Figure 1, highest zeal was expressed by participants with relatively low implicit self-esteem in the threat condition (high and low implicit self-esteem correspond to values one standard deviation above and below the mean of implicit self-esteem; see Aiken & West, 1991). Importantly, at low implicit self-esteem the simple effect of threat on overall zeal was significant, $t(19) = 2.70$, $p < .01$, but at high implicit self-esteem it was marginally significant in the opposite direction, $t(19) = -1.81$, $p = .09$. Further, the simple slope of implicit self-esteem was significant in the threat condition, $t(19) = 3.20$, $p < .005$, but not in the control condition, $t(19) = 0.16$, $p < .87$. This pattern of results reveals that the academic threat manipulation caused people with low implicit self-esteem to exaggerate their zeal about highly charged social issues.

TABLE 1 Means (Standard Deviations) of Participants' Endorsed Opinion Favorability, Extremity, and Consensus Estimates

	Capital punishment	US invasion of Iraq	Suicide bombing
Favorability (from −3 to +3)	−.20 (1.76)	−1.24 (1.36)	−1.17 (1.22)
Extremity (from 1–3)	1.59 (.72)	1.72 (.62)	2.39 (.64)
% Consensus estimate	57 (20)	60 (28)	63 (21)

The positive correlation between the extremity and consensus facets of the zeal index, reported above, might seem surprising because, for each issue, participants had seen an array of eleven diverse opinion statements before selecting their own. Thus, they had just been reminded of how socially contentious each issue really was. One might expect, therefore, that they should have felt *less* supported, and out on a precarious limb to the extent that they took the more extreme positions. The positive correlation between extremity and exaggerated consensus suggests the defensive, motivational nature of both constructs.

Indeed, as shown in Figure 1, the implicit self-esteem × threat interaction pattern of results was similarly significant for both opinion extremity, $t(19) = 2.08$, $p < .05$, and consensus, $t(19) = 2.68$, $p < .05$. Threatened participants with low implicit self-esteem endorsed opinions that were over a full standard deviation more extreme than those endorsed by the control condition participants with low implicit self-esteem, and they also hiked their estimates of social consensus for their opinions to a seemingly fanatical level of over 84%.

Moreover, the motivated zeal response appears to be systemic. As summarized in Table 2, the betas (βs; between .38 and .53) for the implicit self-esteem × threat interaction effects on zeal about each individual issue were substantial and similarly significant. The only exception was suicide bombing, which may have shown a weaker effect ($p < .11$) because it was the third issue (i.e., the threat may have been partially dissipated or masked by zeal about the previous two issues). Future research with more power should use within-subject analyses across counterbalanced issues to assess this possibility.

It is important to note that the present results reflect general zeal, and not a normative shift toward a directional bias in favor of, or against, each topic. When the regression analyses were repeated for zeal about each topic, with topic favorability statistically controlled as a covariate, the results did not change. With

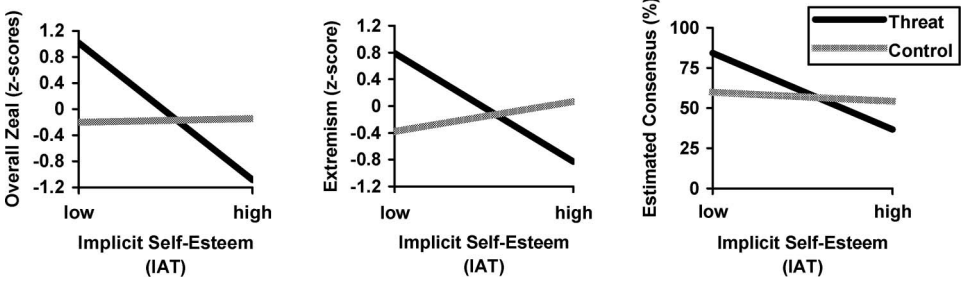

FIGURE 1 Overall zeal, extremism, and social consensus estimates as a function of implicit self-esteem and threat.

TABLE 2 Betas and *P*-values for the Implicit Self-Esteem × Threat Interaction Effect on Overall Zeal and Facets of Zeal

Dependent variable	Interaction effect β and p-value
Overall zeal across issues	.62, $p < .009$
Zeal about capital punishment	.51, $p < .05$
Zeal about Iraq	.53, $p < .04$
Zeal about suicide bombing	.38, $p < .11$
Zealous consensus across issues	.55, $p < .02$
Zealous extremism across issues	.51, $p < .05$

opinion favorability as a covariate, the βs for the implicit self-esteem × threat interaction effects on zeal about each issue increased by .01 for two issues, and decreased by .01 for the other issue. (Indeed, with opinion favorability as a covariate, the β for the interaction effect on zeal about suicide bombing shifted from being a trend to being marginal in significance, $p < .09$.) Moreover, with overall zeal across all three issues as the dependent variable, the β and significance of the interaction effect increased from $\beta = .62$, $p < .009$ to $\beta = .68$, $p < .004$ when all three favorability ratings were included as covariates in the main regression analysis. Thus, the defensive zeal reactions of participants with low implicit self-esteem clearly do not reflect a normative shift in any particular ideological direction. Rather, they reflect exaggerated moral enthusiasm for idiosyncratic personal opinions.

Discussion

The present results extend past research on defensive zeal in several ways. First, they show that threats cause zeal even about highly charged, international topics such as suicide bombing and the US invasion of Iraq. Second, the present results provide a replication of previous observations that experimentally manipulated threats cause zeal among individuals with low implicit self-esteem but not high implicit self-esteem (McGregor & Marigold, 2003; McGregor et al., 2005). That the present study was powerful enough to yield significant results with a small sample responding over the Internet attests to the robustness of the defensive zeal phenomenon. Finally, the most important new contribution of the present study was that it demonstrated defensive *extremism* among threatened individuals with low implicit self-esteem. Previous findings have found that the same individuals react to threats with defensive certainty and consensus about their opinions (McGregor & Marigold, 2003; McGregor et al., 2005) but this is the first study to demonstrate defensive extremism. Accordingly, the present findings provide support for classic theorists' claims that vulnerable individuals use excessively intense, supervalent forms of moral enthusiasm to defend against self-threats. Together, the available evidence now indicates that individuals with low implicit self-esteem react to self-threats with wide-ranging zeal about diverse opinions. That ordinary undergraduates can be so easily induced to endorse the potent combination of delusional consensus and extremism about such highly charged social issues is disturbing.

Remaining Questions and Future Directions

The present, sobering results are consistent with the classic view that vulnerable individuals, that is, those with low implicit self-esteem, use malignant zeal for

protection from self-threats. They are also consistent with recent findings indicating that people with low implicit self-esteem are especially likely to use alcohol to mask distressing thoughts (McGregor, 2005, 2006). Evidence for the full pathways from threat, to zealous/alcoholic defenses, to decreased salience of threat for individuals with low implicit self-esteem remains to be demonstrated in a single study.

Future research should also be designed to more clearly assess the joint roles of implicit and explicit self-esteem, and other explicitly assessed personality variables that have been associated with defensive zeal such as high personal need for structure (Kang, Haji, & McGregor, 2006; McGregor & Gailliot, 2006; McGregor & Marigold, 2003; McGregor et al., 2005; Neuberg & Newsom, 1993). Whereas low implicit self-esteem may signal a special *vulnerability* to self-threats, explicit need for structure and explicit self-esteem may be *gating variables* that determine whether zeal will seem like an appealing response to those threats in certain circumstances. Individuals with high personal need for structure scores are especially attracted to self-serving and simplistic social judgments (Kang et al., 2006; Neuberg & Newsom, 1991), especially when in challenging situations (Kruglanski & Webster, 1996), and individuals with high explicit self-esteem scores are not shy about zealously wielding defenses that involve public self-promotion. Individuals with low explicit self-esteem, on the other hand, seem to more humbly lean toward less risky, interdependence-based responses to threats (Baumeister, Tice, & Hutton, 1989; Vohs & Heatherton, 2001). Indeed, this may help account for why, in the two previously published studies that assessed both implicit self-esteem and explicit self-esteem, and then zeal after a manipulated self-threat, the most zealous reactions were among threatened participants with low implicit and high explicit self-esteem. In those studies, in addition to the threat × implicit self-esteem and threat × explicit self-esteem 2-way interaction effects, the 3-way interaction effects were also significant.

A differential willingness of participants with high versus low explicit self-esteem to publicly self-promote might explain a curious auxiliary finding in the present study. Explicit self-esteem was one of the questionnaires assessed in the battery of questionnaires at the beginning of our study, and supplementary analyses showed no interaction effect at all for the explicit self-esteem × threat effect in the present study, $F < 1$. This null effect is puzzling, because high explicit self-esteem has been a reliable moderator of zeal after self-threats in past research—in the two previous studies just described, which assessed both implicit and explicit self-esteem, high explicit self-esteem interacted just as strongly with threat as low implicit self-esteem did (McGregor & Marigold, 2003; McGregor et al., 2005). It is interesting to speculate that the unusual null role of explicit self-esteem in the present study may have been due to the fact that the study was conducted anonymously, over the Internet. As such, self-presentation concerns were likely minimized (Bargh, Fitzimmons, & McKenna, 2003), which may have opened the normally closed gate to expression of zeal for individuals with low explicit self-esteem. This interpretation should be carefully assessed with a larger experiment that measures implicit and explicit self-esteem and manipulates public versus private zeal after self-threats.

If the gating role of explicit self-esteem is correct, then other kinds of self-protective defenses to threats that do not involve public self-promotion should be moderated by implicit self-esteem alone and not by explicit self-esteem. Accordingly, only implicit self-esteem, and not explicit self-esteem ($F < 1$) has been found to moderate defensive alcohol consumption after a self-threat (McGregor, 2005, 2006). Similarly, in other research implicit self-esteem alone, and not explicit self-esteem, moderated defensive self-handicapping after threat (Spalding & Hardin, 1999). Neither alcohol consumption nor self-handicapping

requires risky self-promotion. Thus, these findings are consistent with the view that low implicit self-esteem is a key vulnerability to self-threats, and that high explicit self-esteem may be a gating variable that moderates the use of publicly self-promoting, defensive reactions.

One final promising avenue for future research is the neuropsychological basis of the interaction effect of implicit self-esteem and threat on zeal. In a preliminary study using the IAT, we found that this interaction significantly predicted cerebral hemisphericity (Jordan & McGregor, 2006). Specifically, results revealed that, in the control condition, low implicit self-esteem was associated with relative right hemisphere activation (which is associated with avoidance motivation; Sutton & Davidson, 1997). Importantly, however, threatened individuals with low implicit self-esteem shifted towards relatively more left-hemisphere activation, which is related to promotion focus, approach-motivation, defensiveness, and insulation from threat (Amodio et al., 2004; Harmon-Jones & Allen, 1997; Jackson et al., 2003; Martin & Shrira, 2004; see McGregor, in press, for a review of related literature). In contrast, individuals with high implicit self-esteem shifted towards relative right-hemisphere activation (which is associated with threat processing; Martin & Shrira, 2004; Nitschke, Heller, Palmieri, & Miller, 1999), which may reflect their lack of defensiveness and willingness to openly process the threat as opposed to masking it with zeal. Although preliminary, these intriguing results are consistent with a motivated cerebral hemisphericity account of low implicit self-esteem individuals' tendency to react to threats with zeal. Seizing on zealous thoughts may provide approach-motivated hemispheric insulation against concern with threats.

Concluding Comments

One conclusion that can be confidently drawn from the available evidence, including the present study, is that low implicit self-esteem predisposes people toward zealous reactions to self-threats. Three experiments have now demonstrated that low implicit self-esteem (IAT assessed), whether measured in a lab or over the Internet, interacted with experimentally manipulated self-threats to cause zeal about social issues. The present results extend past findings, and show that defensive zeal reactions involve extremism, as well as exaggerated conviction and consensus estimates for a broad range of vital social issues. Taken together, the research reviewed and presented here supports all three claims made by the classic theorists discussed in the introduction: threats cause zeal; zeal masks threats; and vulnerable people (i.e., those with low implicit self-esteem) are most inclined to use zeal to mask threats. Disturbingly, the present results demonstrate how easily individuals with low implicit self-esteem can be induced to confidently endorse zealous extremes, even on explosive topics.

Notes

1. We opted against relying on the new *D* statistic scoring procedure advocated by Greenwald, Nosek, and Banaji (2003) for practical and theoretical reasons. The practical reason was that our streamlined IAT measure used only 5 blocks instead of 7 (we dropped two of the practice blocks); included only 36 trials per block instead of 40; and did not give performance feedback. Each of these changes would have required adjustments to the *D* statistic scoring procedure, with unknown effects. The theoretical reason for not adopting the new scoring procedure is that it was empirically derived to maximize correlations between implicit and explicit measures. For self-attitudes,

especially, this seems like a questionable criterion, given how motivationally sensitive implicit and explicit self-assessments can be (e.g., Baumeister & Vohs, 2001; McGregor et al., 2005, Study 1; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). Indeed, implicit and explicit self-esteem have produced opposite moderating effects in the two published studies that have compared moderating roles of both implicit and explicit self-esteem on zealous reactions to manipulated self-threats (McGregor & Marigold, 2003, Study 3; McGregor et al., 2005, Study 5). For comparison purposes, however, we did compute the *D* statistic measure of implicit self-esteem (following the Greenwald, Nosek, & Banaji, 2003, algorithm as closely as possible given our modifications). It correlated at $r(22) = .91$ with our simpler index.

2. Participants are extensively debriefed and affirmed after this manipulation.

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