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Optimizing Stress: An Integrated Intervention for Regulating Stress Responses

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Abstract

The dominant cultural valuation of stress is that it is "bad for me." This valuation leads to regulatory goals of reducing or avoiding stress. In this article, we propose an alternative approach —*stress optimization*—which integrates theory and research on *stress mindset* (e.g., Crum, Salovey, & Achor, 2013) and *stress reappraisal* (e.g., Jamieson, Mendes, Blackstock, & Schmader, 2010) interventions. We further integrate these theories with the extended process model of emotion regulation (Gross, 2015). In so doing, we explain how altering second-level valuation systems—shifting the valuation of stress from "is bad for me" to "can be good for me"—fundamentally changes the overarching goal of stress regulation from reducing stress to optimizing stress responses to achieve valued goals. With this optimization goal in mind, individuals are invited to flexibly identify, select, and engage in specific regulation tactics (e.g., situation selection, attentional control, cognitive change, and response modulation) in ways that help them achieve valued ends as opposed to merely reducing or avoiding stressful experiences. We discuss definitions and issues related to key terms including *stress*, *stressors*, *stress responses*, and *stress regulation* and outline a research agenda for testing this new integrated theory as an intervention.

Keywords

stress reappraisal; stress mindsets; challenge and threat; affect regulation; valuation

The dominant cultural valuation of stress is that it is "bad for me." This valuation has arisen, in part, because of research documenting the negative effects of stress on health decisions (Jamieson & Mendes, 2016), brain aging (Jefferson et al., 2010), cardiovascular diseases (Juster, McEwen, & Lupien, 2010), and psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Further propagating this view are villainizing headlines like, "A cold fact:

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High stress can make you sick" (Brody, 1998) and "Work-related stress can kill, study finds" (Kahn, 2008).

The truth of stress, however, is not so grim. Multiple lines of research link the experience of stress with beneficial outcomes. For instance, studies have linked stress with personal initiative and productivity (Dienstbier, 1989; Epel, McEwen, & Ickovics, 1998; Fay & Sonnentag, 2002) as well as "physiological thriving" (Dienstbier, 1989; Epel et al., 1998). Moreover, even high-intensity stress experiences triggered by life-threatening events can sometimes have positive outcomes, including improved relationships, greater appreciation for life, and enhanced perceptions of strength, a phenomenon known as "post-traumatic growth" (Tedeschi & Calhoun, 2004).

What then determines whether stress helps or harms people? Early research focused on features of stressful experiences, such as frequency, severity, and duration, as key determinants (e.g., Holmes & Rahe, 1967). However, more recent research has shown that how people attend to, evaluate, and cope with the stress they experience directly determines downstream outcomes (Carver, Scheier, & Weintraub, 1989; Lazarus & Folkman, 1984). On the basis of foundational research on *stress mindset* (e.g., Crum et al., 2013) and *stress reappraisal* (e.g., Jamieson et al., 2010), we introduce an integrated theoretical model—*stress optimization*—that is further informed by the extended process model of emotion regulation (EPM; e.g., Gross, 2015). Stress optimization provides a theoretical framework to understand how altering second-level valuation systems (i.e., whether stress and concomitant responses are valued as "good for me" or "bad for me") fundamentally alters stress regulation goals. As an intervention, stress optimization guides individuals toward flexibly identifying, selecting, and implementing regulation tactics consistent with the goal of optimizing stress responses to achieve valued ends, as opposed to merely reducing or avoiding stress.

In detailing stress optimization, we first clarify key terms including *stress, stress responses*, and *stress regulation*. Second, we review and integrate research on stress mindset, stress reappraisal, and the EPM. Third, we discuss how stress optimization goals inform regulatory tactics, including situation selection, attentional deployment, cognitive change, and response modulation. Finally, we offer suggestions for future research to inform theory development and applications of stress optimization.

Toward More Useful Terminology: (Re)Defining Stress and Stress Responses

Hans Selye (1974), a pioneer in stress research and theory, insisted that the experience of stress can have negative (distress) or positive (eustress) outcomes, and he defined *stress* as "the nonspecific response of the body to any demand made upon it" (p. 137). Nevertheless, the term *stress* has become synonymous with distress. Indeed, the most widely used self-report measure of stress (the Perceived Stress Scale; Cohen, Kamarck, & Mermelstein, 1983) includes questions such as, "How often have you felt that difficulties were piling up so high that you could not overcome them?" Questions like this associate stress with negative

emotions and "threat" characterized by situational demands exceeding coping resources (e.g., Blascovich, Mendes, Hunter, & Salomon, 1999).

Common definitions and measures of stress beg the question: Does stress exist if demands are high but when one also feels capable of managing or thriving from the stressful experience? "Stress is bad" definitions would suggest that coping with or even thriving under stress would not, by definition, constitute a stressful experience. This is problematic because it ignores potentially positive outcomes that may come from stressful situations. Further, it assumes that experiences of stress and the negative effects of stress necessarily co-occur, suggesting that the only way to remove the negative effects is to avoid or reduce the stressful experience. However, some of our most treasured and meaningful experiences involve stress, be it excelling in one's career, maintaining deep relationships, or raising children. Indeed, when people are invited to reflect on the times in their lives when they have learned, grown substantially, or performed at exceptionally high levels, they often report those times having been deeply stressful.

To stay true to Selye's (1976) notion of stress having either negative (distress) or positive (eustress) outcomes it is essential to separate causes of stress (stressors) from reactions to stress (stress responses). Accordingly, we define *stress* as the anticipation or experience of encountering demands (e.g., danger/conflict, uncertainty, or pressure) in one's goal-related contexts (Carver & Connor-Smith, 2010) and *stress responses* as the body's nonspecific responses (e.g., physiological, behavioral, and emotional) to the experience of stress.[1] *Stressors* can therefore be defined as manifold aspects of one's life that could cause stress, including for example poverty, acute trauma, a conflict with one's spouse, a diagnosis of cancer, an impending exam, or heavy traffic. By definition, these situations cause stress to the degree that they are anticipated or experienced as demanding in a goal-related context (i.e., they are important to the person experiencing them).

These nomological distinctions are especially critical when it comes to stress regulation, which we define as the manner in which stress responses are changed or altered. Defining stress as the anticipation or experience of encountering demands, and separating it from outcomes, suggests that stress responses can be regulated—and ideally optimized—regardless of whether the stressor (i.e., demand) itself is viewed as "good" (e.g., having a child) or "bad" (e.g., having a disease). Moreover, even in the context of "bad" stressors, it may be possible to perceive stress as "good" and intentionally alter one's stress response as a result of this positive valuation. Although stress regulation resembles coping in that both reflect ways of changing stress responses, coping can sometimes imply merely surviving or subsisting. Thus, we prefer the term stress regulation because we wish to also convey the possibility of optimizing stress responses such that one's life is improved, not despite—but

[1]The terms *threat* and *challenge* are also used by scholars and refer to types of stress responses that manifest depending on the ratio of one's perceived resources (e.g., familiarity, knowledge, skills/ability, dispositional factors, and social support) to one's perceived demands (e.g., uncertainty, danger, and effort). Challenge is experienced when appraisals of resources outweigh demands, whereas threat is experienced when demands exceed resources (Jamieson, 2017). Threat is linked to negative physiological, psychological, and behavioral effects, whereas challenge leads to positive outcomes (e.g., Akinola, Fridman, Mor, Morris, & Crum, 2016; Blascovich et al., 1999; Jamieson et al., 2012). However, there are cases in which threat states are less harmful and challenge states are maladaptive (Akinola & Mendes, 2008; Crum et al., 2017). Thus, it is important to distinguish stressors and appraisals associated with stressors (e.g., threat or challenge) from stress responses that may be more or less beneficial. This distinction is necessary for interventions to better facilitate desired outcomes.

because of—the stress. In the next sections, we review foundational research on stress mindset and stress reappraisal and explain how, by integrating these models and incorporating them into the EPM, individuals can flexibly apply regulation tactics in the service of optimizing—rather than avoiding—stress to achieve valued goals.

Stress Mindset and Stress Reappraisal Interventions: Changing the Valuation of Stress

Although the majority of past stress regulation research has focused on reducing the intensity or frequency of stressful experiences (e.g., Bränström, Kvillemo, Brandberg, & Moskowitz, 2010; Hembree, 1988; see Somerfield & McCrae, 2000 for a review), markedly different approaches have emerged. The stress mindset and stress reappraisal interventions independently emerged from mindset theory and the biopsychosocial model of challenge and threat, respectively (for an extended review see, Jamieson, Crum, Goyer, Marotta, & Akinola, 2018). Contrary to prior stress reduction and avoidance strategies, stress mindset and stress reappraisal interventions were designed to inform people that the broad nature of stress (in the case of stress mindset) and specific stress responses (in the case of stress reappraisal) can be enhancing, functional, and/or beneficial.[2] Accumulating evidence shows that these interventions—which can be delivered via live training or online—can improve psychological, attentional, physiological, and behavioral responses to stress, and enhance subsequent performance and well-being (Beltzer, Nock, Peters, & Jamieson, 2014; Crum, Akinola, Martin, & Fath, 2017; Crum et al., 2013; Jamieson et al., 2010, 2016; John-Henderson, Rheinschmidt, & Mendoza-Denton, 2015).

Given common conceptualizations that stress is bad, how can these approaches that highlight the benefits of stress be so effective at improving downstream outcomes? The theorized and observed mechanisms are detailed elsewhere (for reviews, see Jamieson, Crum, et al., 2018; Jamieson, Hangen, Lee, & Yeager, 2018), but from the perspective of the EPM both of these approaches fundamentally change the valuation of stress. That is, stress is no longer valued as only “bad for me,” but it is perceived as being potentially “good forme.” This change in valuation has two important effects. First, it removes the stress people experience about the purported negative effects of stress—or “stress about stress” (e.g., Brady, Hard, & Gross, 2018). Second, it fundamentally changes the goal of stress regulation. If one holds the valuation (determined by either an overarching mindset or a situational appraisal) that stress is bad, the primary motivation is to avoid or reduce stress to prevent debilitating outcomes. If, on the other hand, stress is valued as “good for me,” the primary motivation is to accept and utilize stress to achieve enhancing outcomes. Broadly speaking, acceptance and approach-oriented strategies have proven to be more effective than denial and regulation strategies in many instances (e.g., Greenberg, 2012; Mennin & Fresco, 2014).

[2] *Mindset* refers to a core association regarding the nature and processes of things in the world (e.g., Crum et al., 2013; Dweck, 2006). Appraisals are judgments or assessments of the meaning of events as or after they occur (e.g., Lazarus & Folkman, 1984).

Optimizing Stress: An Integrated Intervention Approach

Existing stress mindset and appraisal interventions rely on disseminating valid, albeit one-sided, information about stress to promote adaptive motivational, physiological, and affective responses to stress. This unilateral approach raises ethical and practical questions: To what extent is it ethical to neglect discussing the negative effects of stress? What are the consequences of encountering contrary information? Stress optimization provides an integrated approach to overcome these limitations. Informed by stress mindset and stress appraisal theory, the stress optimization approach aims to establish the second-level valuation that stress can be good for me. Furthermore, inspired by the EPM, the integrated optimization approach focuses on empowering individuals to identify, select, and apply regulatory strategies on their own. We define optimization as the means to make the best or most effective use of situations, opportunities, or resources. Thus, regulating stress by focusing on optimization is not about reducing stress, but flexibly applying regulation tactics to achieve goals and values. As illustrated in Figure 1, stress optimization can be achieved through a number of different stress regulation strategies. In the following text, we provide examples for how situation selection, attentional deployment, cognitive change, and response modulation strategies can differ between goals of optimizing versus avoiding stress.

Situation Selection

Counter to most stress reduction approaches, the goal of optimizing stress might, in some cases, lead people to seek out stressful situations. The intention of stress optimization is to select situations (regardless of the stress they might cause) that create opportunities to grow, learn, and discover. For example, a person might seek to address a conflict with their partner rather than avoid it, subject themselves to difficult training to prepare for a competition or seek out health information to facilitate prevention or treatment. Additionally, the goal of optimizing stress can also lead people to disengage with stressful situations that do not align with valued goals. For example, dissolving a relationship that is unfulfilling, or turning down opportunities in order to complete unfinished tasks, despite that saying “no” or exiting situations can themselves be highly stressful.

Attentional Deployment

With the goal of optimizing stress, an individual can attend to the underlying goals and opportunities associated with the stress, rather than being overly myopic on the negative aspects of stress. For example, if someone is facing an impending exam, rather than focusing on all the ways the stress they are feeling is uncomfortable, they can focus on the fact that they are stressed because performing well on the exam is important to them and devote more attentional resources toward achieving this goal. Moreover, one may also attend to unforeseen opportunities that may arise in the midst of stress (e.g., a cancer diagnosis could be an opportunity to redefine values and live in a more meaningful way). At a lower cognitive level, research has shown that valuing stress as functional is associated with reduced attentional biases for emotionally negative information (e.g., Jamieson, Nock, & Mendes, 2012) and increased attentional bias toward sources of positivity (e.g., Crum et al., 2017).

Cognitive Change

Reappraisal processes, some of the most heavily studied emotion regulation tactics (e.g., Ochsner & Gross, 2008), represent a broad array of strategies in which an individual can alter their thoughts in an attempt to regulate their stress. The key distinction with the stress optimization approach is that an individual will be more likely to choose reappraisal strategies that are aimed at optimizing rather than reducing or ignoring stress. For instance, rather than attempting to reappraise a situation in a way that makes it seem less stressful (e.g., trying to "put stress out of your mind"), an individual can employ reappraisal tactics to change perceptions of the stressor and one's ability to regulate one's responses to it effectively (e.g., "I have what it takes to manage this diagnosis"). Reappraisal tactics can be employed at the level of the situation or stressor (e.g., viewing piling demands as evidence of a positive trajectory; Crum & Crum, 2015) and/or at the level of the stress response (e.g., anxiety and arousal means "I'm excited"; Brooks, 2014).

Response Modulation

Response modulation refers to modifying behavioral, physiological, and psychological stress responses after stress is experienced. Rather than modulation strategies intended to suppress stress responses (e.g., suppressing stress-related arousal by taking beta-blockers or drinking alcohol) or suppress behavioral displays associated with stress responses (e.g., remaining stoic), stress optimization encourages people to utilize or even upregulate stress responses to facilitate goal attainment. For example, a student experiencing stress about an exam may seek to drink a cup of coffee to help them better prepare for the upcoming exam, thereby optimizing the stress associated with the exam. In fact, upregulating arousal outputs via "pump up" music, pep talks, and warmups, to name a few, are common strategies employed by athletes before high-stakes games. Of course, people who are overly keyed-up may instead seek to engage in deep-breathing or other relaxation techniques in order to regulate their physiological responses to be in a more optimal state before a game. Here again, the choice of response modulation strategy would be chosen based on the goal of optimizing the outcome in the stressful situation (because "stress can be good for me"), not on simply reducing the stress (because "stress is bad for me").

Future Research

To date, the stress optimization intervention approach is largely theoretical, although several of its components have been empirically examined. Future research should flesh out and test processes described by the model using experimental methods. In particular, we recommend the following agenda:

1. Redesign self-report measures to distinguish between stress, stressors, and stress responses, and move away from a unilateral "stress is bad" conceptualization.
2. Experimentally test the stress optimization intervention in various settings using multiple dissemination modalities (live, in-person, virtual application, etc.), and examine physiological, behavioral, and performance-based outcomes and mechanisms.

3. Directly compare stress optimization to traditional stress management interventions and to existing stress mindset or stress appraisal interventions (for a similar approach see Rozek, Ramirez, Fine, & Beilock, 2019).

4. Explore the impact of stress optimization tactics in the context of different types of stressors (e.g., acute vs. chronic and controllable vs. uncontrollable), and explore targeted moderators (e.g., demographic factors, attributional style) and boundaries of the effect.

5. Explore the ways in which stress optimization promotes emotion regulation flexibility (e.g., Bonanno & Burton, 2013; Gross, 2015) and how engendering such flexibility may improve stress regulation and well-being.

Summary

How people respond to the stressors they face is a key determinant of health and well-being. Herein we present an integrated theoretical model aimed at optimizing stress by identifying, selecting, and applying regulation techniques that serve to achieve underlying values as opposed to merely reducing the stress people experience. Our hope is that this integrated theory, inspired by independent, but increasingly aligned, research traditions (stress mindset, stress reappraisal, and EPM) will help explain how Selye (1976) himself was able to stay healthy and happy by "converting distress into eustress" (p. 55) and to equip others to do the same. More broadly, we hope this review demonstrates the value that can originate from bridging independent models and interventions to advance affective science.

Recommendations for additional reading are given in online supplemental material accompanying this article.

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References

Akinola M, Fridman I, Mor S, Morris MW, & Crum AJ (2016). Adaptive appraisals of anxiety moderate the association between cortisol reactivity and performance in salary negotiations. PLoS ONE, 11(12), e0167977 10.1371/journal.pone.0167977 [PubMed: 27992484]

Akinola M, & Mendes WB (2008). The dark side of creativity: Biological vulnerability and negative emotions lead to greater artistic creativity. Personality and Social Psychology Bulletin, 34, 1677–1686. 10.1177/0146167208323933 [PubMed: 18832338]

Aldao A, Nolen-Hoeksema S, & Schweizer S (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. Clinical Psychology Review, 30, 217–237. 10.1016/jcpr.2009.11.004 [PubMed: 20015584]

Beltzer ML, Nock MK, Peters BJ, & Jamieson JP (2014). Rethinking butterflies: The affective, physiological, and performance effects of reappraising arousal during social evaluation. Emotion, 14, 761–768. 10.1037/a0036326 [PubMed: 24749642]

Blascovich J, Mendes WB, Hunter SB, & Salomon K (1999). Social "facilitation" as challenge and threat. Journal of Personality and Social Psychology, 77, 68–77. 10.1037/0022-3514.77T.68 [PubMed: 10434409]

Bonanno GA, & Burton CL (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. Perspectives on Psychological Science, 8, 591–612. 10.1177/1745691613504116 [PubMed: 26173226]

Brady ST, Hard BM, & Gross JJ (2018). Reappraising test anxiety increases academic performance of first-year college students. Journal of Educational Psychology, 110, 395–406. 10.1037/edu0000219

Bränström R, Kvillemo P, Brandberg Y, & Moskowitz JT (2010). Self-report mindfulness as a mediator of psychological well-being in a stress reduction intervention for cancer patients—A randomized study. Annals of Behavioral Medicine, 39, 151–161. 10.1007/s12160-010-9168-6 [PubMed: 20177843]

Brody JE (1998, 5 12). A cold fact: High stress can make you sick. The New York Times. Retrieved from https://www.nytimes.com/1998/05/12/science/a-cold-fact-high-stress-can-make-you-sick.html

Brooks AW (2014). Get excited: Reappraising pre-performance anxiety as excitement. Journal of Experimental Psychology: General, 143, 1144–1158. 10.1037/a0035325 [PubMed: 24364682]

Carver CS, & Connor-Smith J (2010). Personality and coping. Annual Review of Psychology, 61, 679–704. 10.1146/annurev.psych.093008.100352

Carver CS, Scheier MF, & Weintraub JK (1989). Assessing coping strategies: A theoretically based approach. Journal of Personality and Social Psychology, 56, 267–283. 10.1037/0022-3514.56.2.267 [PubMed: 2926629]

Cohen S, Kamarck T, & Mermelstein R (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385–396. 10.2307/2136404 [PubMed: 6668417]

Crum AJ, Akinola M, Martin A, & Fath S (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress. Anxiety, Stress, and Coping, 30, 379–395. 10.1080/10615806.2016.1275585

Crum AJ, & Crum T (2015, 9). Stress can be a good thing if you know how to use it. Harvard Business Review. Retrieved from https://hbr.org/2015/09/stress-can-be-a-good-thing-if-you-know-how-to-use-it

Crum AJ, Salovey P, & Achor S (2013). Rethinking stress: The role of mindsets in determining the stress response. Journal of Personality and Social Psychology, 104, 716–733. 10.1037/a0031201 [PubMed: 23437923]

Dienstbier RA (1989). Arousal and physiological toughness: Implications for mental and physical health. Psychological Review, 96, 84–100. 10.1037/0033-295X.96T.84 [PubMed: 2538855]

Dweck CS (2006). Mindset: The new psychology of success. New York, NY: Random House.

Epel ES, McEwen BS, & Ickovics JR (1998). Embodying psychological thriving: Physical thriving in response to stress. Journal of Social Issues, 54, 301–322. 10.1111/j.1540-4560.1998.tb01220.x

Fay D, & Sonnentag S (2002). Rethinking the effects of stressors: A longitudinal study on personal initiative. Journal of Occupational Health Psychology, 7, 221–234. 10.1037/1076-8998.7.3.221 [PubMed: 12148954]

Greenberg LS (2012). Emotions, the great captains of our lives: Their role in the process of change in psychotherapy. American Psychologist, 67, 697–707. 10.1037/a0029858 [PubMed: 23163464]

Gross JJ (2015). Emotion regulation: Current status and future prospects. Psychological Inquiry, 26, 1–26. 10.1080/1047840X.2014.940781

Hembree R (1988). Correlates, causes, effects, and treatment of test anxiety. Review of Educational Research, 58, 47–77. 10.3102/00346543058001047

Holmes TH, & Rahe RH (1967). The social readjustment rating scale. Journal of Psychosomatic Research, 11, 213–218. 10.1016/0022-3999(67)90010-4 [PubMed: 6059863]

Jamieson JP (2017). Challenge and threat appraisals In Elliot A, Dweck C, & Yeager D (Eds.), Handbook of motivation and cognition (2nd ed., pp. 175–191). New York, NY: Guilford Press.

Jamieson JP, Crum AJ, Goyer JP, Marotta ME, & Akinola M (2018). Optimizing stress responses with reappraisal and mindset interventions: An integrated model. Anxiety, Stress, and Coping, 31, 245–261. 10.1080/10615806.2018.1442615

Jamieson JP, Hangen EJ, Lee HY, & Yeager DS (2018). Capitalizing on appraisal processes to improve social stress responses. Emotion Review, 10, 30–39. 10.1177/1754073917693085 [PubMed: 31178923]

Jamieson JP, & Mendes WB (2016). Social stress facilitates risk in youths. Journal of Experimental Psychology: General, 145, 467–485. 10.1037/xge0000147 [PubMed: 26866533]

Jamieson JP, Mendes WB, Blackstock E, & Schmader T (2010). Turning the knots in your stomach into bows: Reappraising arousal improves performance on the GRE. Journal of Experimental Social Psychology, 46, 208–212. 10.1016/j.jesp.2009.08.015 [PubMed: 20161454]

Jamieson JP, Nock MK, & Mendes WB (2012). Mind over matter: Reappraising arousal improves cardiovascular and cognitive responses to stress. Journal of Experimental Psychology: General, 141, 417–422. 10.1037/a0025719 [PubMed: 21942377]

Jefferson AL, Himali JJ, Beiser AS, Au R, Massaro JM, Seshadri S,… Manning WJ (2010). Cardiac index is associated with brain aging: The Framingham Heart Study. Circulation, 122, 690–697. 10.1161/CIRCULATIONAHA.109.905091 [PubMed: 20679552]

John-Henderson NA, Rheinschmidt ML, & Mendoza-Denton R (2015). Cytokine responses and math performance: The role of stereotype threat and anxiety reappraisals. Journal of Experimental Social Psychology, 56, 203–206. 10.1016/j.jesp.2014.10.002

Juster RP, McEwen BS, & Lupien SJ (2010). Allostatic load biomarkers of chronic stress and impact on health and cognition. Neuroscience and Biobehavioral Reviews, 35, 2–16. 10.1016/j.neubiorev.2009.10.002 [PubMed: 19822172]

Kahn M (2008). Work-related stress can kill, study finds. Reuters. Retrieved from https://www.reuters.com/article/us-heart-stress/work-related-stress-can-kill-study-finds-idUSL2284632220080123

Lazarus RS, & Folkman S (1984). Stress, appraisal, and coping. New York, NY: Springer.

Mennin DS, & Fresco DM (2014). Emotion regulation therapy In Gross J (Ed.), Handbook of emotion regulation (2nd ed., pp. 469–490). New York, NY: Guilford Press.

Ochsner KN, & Gross JJ (2008). Cognitive Emotion Regulation: Insights from Social Cognitive and Affective Neuroscience. Current Directions in Psychological Science, 17, 153–158. 10.1111/j.1467-8721.2008.00566.x [PubMed: 25425765]

Rozek CS, Ramirez G, Fine RD, & Beilock SL (2019). Reducing socioeconomic disparities in the STEM pipeline through student emotion regulation. Proceedings of the National Academy of Sciences of the United States of America, 116, 1553–1558. 10.1073/pnas.1808589116 [PubMed: 30642965]

Selye H (1974). Stress without distress In Serban G (Ed.), Psychopathology of human adaptation (pp. 137–146). Boston, MA: Springer.

Selye H (1976). Forty years of stress research: Principal remaining problems and misconceptions. Canadian Medical Association Journal, 115, 53–56. [PubMed: 1277062]

Somerfield MR, & McCrae RR (2000). Stress and coping research. Methodological challenges, theoretical advances, and clinical applications. American Psychologist, 55, 620–625. 10.1037/0003-066X.55.6.620 [PubMed: 10892204]

Tedeschi RG, & Calhoun LC (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. Psychological Inquiry, 15, 1–18. 10.1207/s15327965pli1501_01

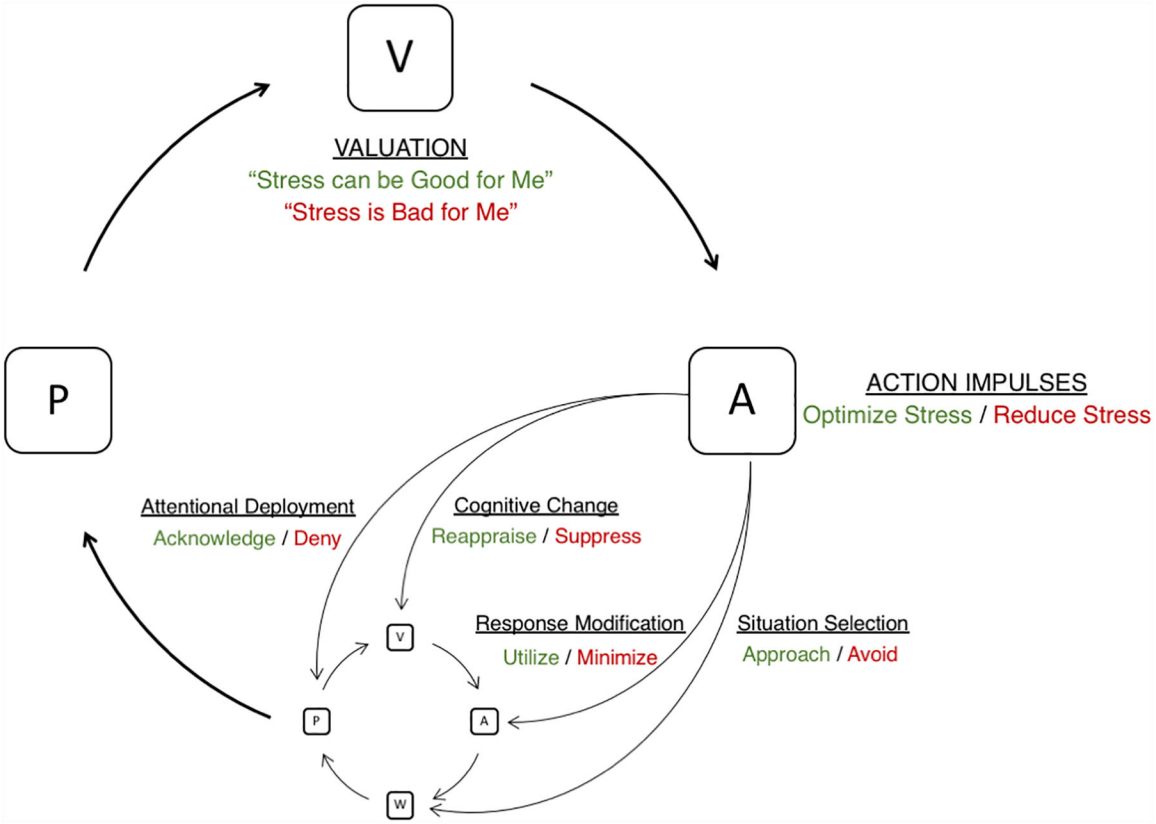

Figure 1.

Akin with value models depicted in Gross (2015), "W" refers to the internal or external world. "P" refers to a perception of whatever that valuation system is tuned to "see." "V" refers to a valuation of that perception as indifferent, good for me, or bad for me and "A" refers to the action impulses engendered by that valuation. Text in grey or green depicts the stress optimization approach—specifically, how changing the valuation of stress from "is bad for me" (black text) to "can be good for me" (grey or green text) alters action impulses and corresponding regulation strategies accordingly.