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Review article

THE BIDIRECTIONAL RELATIONSHIP BETWEEN STRESS AND PSYCHOPATHOLOGY: REVISITING THE STRESS GENERATION HYPOTHESIS

Abstract:

For more than three decades, the stress generation hypothesis has inspired in-depth study of the relationship between psychopathological phenomena and stressful experiences. The model proposes that in individuals already struggling with significant mental health problems, certain personality, cognitive, and interpersonal vulnerability factors lead to experiencing a higher rate of stressful life events. Initially, the hypothesis was proposed in relation to depression, but it was later associated with other mental disorders as well. Unlike dominant assumptions about the relationship between stress and psychopathology, this model highlights the active role that individuals play in shaping their life circumstances. This generated, so-called, dependent stress is both an outcome (at least partly) of impaired mental health, as well as a mechanism that maintains or exacerbates psychological dysfunctions. The paper presents a brief review of empirical findings that support the transdiagnostic utility of the model and provide insight into risk factors for stress generation. Clinical implications relevant to the treatment of impaired mental health are discussed, along with methodological limitations and recommendations, as well as directions for future research.

Keywords: stress generation, dependent stressors, psychopathology, transdiagnostic

More than three decades ago, Constance Hammen proposed an alternative explanation for the relationship between stress and psychopathology, as opposed to the dominant diathesis-stress model (Hammen, 1991). Primarily focusing on understanding the relationship between depression and stress - and motivated by the observation that individuals with a history of depressive disorder experience a higher rate of stressful life events - she formulated the stress generation hypothesis. Instead of interpreting depressive symptomatology as an outcome of the interaction between biopsychosocial vulnerability factors (diatheses) and contextual stressors, Hammen suggested that people actively shape their life circumstances and their reactions to them. It is precisely the interaction between the depressive state, individual behavior, and certain personality traits that gives rise to stressful experiences, which in turn further deteriorate the psychological status, leading to a chronic course of the disorder.

Hammen distinguishes between so-called *dependent* and *independent* stressful life events. The model focuses on events that are influenced by symptoms, personal actions, and/or traits - i.e., that are (at least partly) dependent on them. Independent events, often referred to as "fateful" events within this perspective (Shrout et al., 1989), are unrelated to the condition, behavior, or traits of the individual. Therefore, when empirically testing this hypothesis, it is necessary not to examine overall stress exposure but to differentiate stressful events on the basis of their relationship with psychopathology, traits and behavior of the participants (Hammen, 2005). For this purpose, it is essential to use structured threat interviews and to objectively differentiate stressors on the basis of relevant contextual information.

Drawing on the cognitive model of depression, Hammen initially proposed that maladaptive cognitive patterns, on the one hand, and impaired interpersonal functioning, on the other hand, would lead to more frequent stress generation among individuals diagnosed with depression (Hammen, 2018). This does not mean that the individual should be blamed for the unfavorable life circumstances but rather that the course and outcomes of existing psychopathology should be studied contextually. The initial empirical findings of Hammen (1992) clearly illustrate that there is typically a complex relationship between unstable and high-risk life circumstances, in which individuals with chronic depression live, and their traits and behaviors, which generate additional challenges and psychological dysfunctions. Furthermore, the most common dependent stressors in individuals with depression are interpersonal stressful experiences (Hammen, 2006).

Transdiagnostic utility

Eventhough the model was initially focused on depressive disorders, it was later increasingly empirically linked to the spectrum of internalizing psychopathology, as well as to distinct externalizing phenomena, revealing a differentiated set of relationships between the typology of stressful events and

psychopathological dimensions (Conway et al., 2012). However, findings on the universality of these effects were often inconsistent (Liu and Alloy, 2010). Nevertheless, recently, two extensive meta-analyses that synthesized three decades of research have provided strong empirical support for the transdiagnostic applicability of the model (Liu et al., 2024; Rnic et al., 2023).

In both reviews, studies focused predominantly on depressive disorders, but each also included a substantial number of studies on anxiety disorders, trauma-related disorders, personality disorders, substance use disorders, disruptive disorders, ADHD symptoms, and general psychopathology. The analyses revealed that psychopathology was associated more strongly with *dependent* stressors than with *independent* stressors. This effect was found across all types of psychopathology examined, including subclinical levels, i.e., in nonclinical samples. This finding, in fact, represents the most robust evidence for the validity of the model. Furthermore, the generation of dependent stress was associated equally with the internalizing and externalizing psychopathology spectra.

At the level of disorder clusters, depression was associated more strongly with dependent stress than anxiety was but not more strongly associated with dependent stress than other groups of disorders were. The weaker association with anxiety may result from the distinct tendency to avoid stressors, which is inherent to anxiety syndromes. Therefore, it is not surprising that anxiety symptoms, as well as anxiety disorders, played a proximal role in stress generation - that is, their effect diminishes over time. On the other hand, the effects of depression and externalizing disorders persisted, most likely because they are related to more stable personality, cognitive, and interpersonal risk factors (Liu et al., 2024; Rnic et al., 2023).

The meta-analyses also confirmed the pathogenicity of dependent stressors, revealing that generated dependent stress has a stronger effect on the chronicity of psychopathology than does independent stress. This finding underscores the necessity of incorporating this phenomenon into conceptual models of psychopathology and linking it to the process of stress sensitization - that is, the decrease in stress levels needed to trigger a subsequent episode of a particular mental disorder (Stroud, 2020).

Importantly, the reviews included only studies published in English and predominantly conducted in Western societies. Owing to a lack of consistent and comparable data, they did not examine the role of comorbidity, which is highly prevalent between depression and other mental disorders and could amplify the findings on the transdiagnostic utility of the model. However, both groups of authors employed rigorous analytical procedures, grounded in both frequentist (Rnic et al., 2023) and Bayesian statistics (Liu et al., 2024). Given that the analyses revealed no differences in effects in symptoms vs. diagnosed disorders, current vs. past psychopathology, nor cross-cultural differences, or differences related to the publication period of the studies, this unequivocally confirms the universality of the phenomenon.

Risk and protective factors

Numerous studies over the past decades have examined the various categories of factors that may increase the risk of stress generation (Hammen, 2015; Liu et al., 2024). Among clinical factors, the strongest empirical support has been found for the severity and type of psychopathology. For example, comorbidity has been associated with a greater risk of stress generation than a single disorder (Connolly et al., 2010). Even mixed symptomatology, in the absence of a formal diagnosis, has been shown to prospectively increase the risk of dependent stressful events (Meyer and Curry, 2017). Moreover, internalizing psychopathology - particularly depression - is a stronger predictor of interpersonal dependent stress than externalizing psychopathology is (Liu et al., 2024; Rnic et al., 2023).

Among psychological factors, personality traits, negative cognitive styles, and maladaptive coping strategies are significant vulnerability factors. Neuroticism is the most frequently studied distal predictor, and findings unequivocally confirm that it increases the likelihood of experiencing dependent stressors across different age groups and types of psychopathology, even though effect sizes vary (Liu et al., 2024; Meyer and Curry, 2017). Disinhibition and antagonism have also been identified as significant personality predictors of stress generation (Liu et al., 2024; Santee et al., 2023). With respect to cognitive and behavioral vulnerability factors, empirical support exists for several proximal predictors, such as dysfunctional beliefs, anxiety sensitivity, perceived control, rumination, excessive reassurance-seeking, and both cognitive and behavioral avoidance (Liu et al., 2024; Meyer and Curry, 2017; Santee et al., 2023). Additionally, interpersonal factors such as anxious and avoidant attachment styles and interpersonal sensitivity can also contribute to stress generation (Liu et al., 2024). These relational patterns can elicit or exacerbate interpersonal conflicts, which in turn increase interpersonal stress (Eberhart and Hammen, 2009).

Among the sociodemographic factors, findings regarding age and gender are inconsistent. For example, one of the two previously discussed meta-analyses revealed that adolescence and early adulthood are associated with increased generation of dependent stress as an outcome of internalizing psychopathology compared with older age, which is consistent with normative developmental processes (Rnic et al., 2023). In contrast, the other meta-analysis did not find that age was a significant predictor of stress generation (Liu et al., 2024). This discrepancy may be due to differences in age categorization and selection of the included studies. Another limitation is that most studies have thus far been conducted with younger participants, narrowing the comparative scope.

With respect to gender, some studies suggest that women are more likely than men to experience dependent interpersonal stress (Hammen, 2005; Liu, 2013). This relationship appears to be mediated by emotional dependence and co-rumination. Moreover, women generally place greater importance on interpersonal relationships, which may increase the likelihood of interpersonal

stress (Bouchard & Shih, 2013). Meta-analytic findings are inconclusive in this domain as well. One of the reviews reported no gender differences in stress generation (Rnic et al., 2023), whereas the other reported a small effect on interpersonal stress (Liu et al., 2024).

In the past decade, research interests have expanded to include biological risk factors. For example, a reduced neural response to reward has been identified as a potential risk factor for the generation of dependent stress (Mackin et al., 2019). This suggests that impaired processing of reward-related information may lead to behavioral changes that in turn elicit additional stress, thereby increasing vulnerability to psychopathology. Additionally, a recent systematic review highlighted the importance of identifying genetic markers involved in the process of generating dependent stress (Bahji et al., 2021). However, the limited number of prospective studies in this domain constrains the validity of the evidence supporting the initially proposed moderating role of genetic variations in serotonin systems, the HPA axis, and the oxytocin system.

Finally, in regard to protective factors, research efforts have unfortunately been far more modest. A recent meta-analytic review of several studies investigating psychological predictors such as extraversion and positive emotionality/positive affect revealed no significant protective effects (Santee et al., 2023). Therefore, the extensively documented beneficial role of numerous adaptive forms of psychological functioning - not only potentially protective personality traits - when coping with stress, should inevitably guide future research efforts in this field.

Clinical implications

Understanding the reciprocal relationship between stress and impaired mental health is crucial for the development of effective interventions (Hammen, 1992). Current findings indicate that interventions aimed at preventing stress generation should address individual vulnerability factors, such as negative cognitive styles, maladaptive interpersonal behavior and coping strategies, as well as contextual factors, such as stressful life circumstances or insufficiently supportive social environments.

Psychotherapeutic approaches, such as cognitive-behavioral therapy and interpersonal therapy, may be particularly effective, as they target cognitive changes and improvements in social functioning. Additionally, interventions focused on effective problem solving, emotion regulation, and regulation of the physiological stress response - such as mindfulness-based interventions - can enhance coping resources (Liu, 2013).

Given the rise of transdiagnostic interventions in clinical practice, the development of protocols focused on this mechanism may be a particularly promising direction for expanding treatment possibilities. In fact, considering that the model emphasizes the active role of individuals in shaping their life circumstances, all types of interventions that facilitate understanding one's own

role in interactions with the environment, as well as that strengthen resources for effective and flexible adaptation vs accommodation in dealing with stressful events, could demonstrate therapeutic benefits. On the other hand, preventive community and school programs can help with early identification and modification of risky behavior before it leads to chronic psychopathology (Hammen & Shih, 2008).

Methodological limitations

Current research on stress generation faces several methodological threats. A large proportion of studies are based on cross-sectional designs and utilize self-report measures due to their cost-effectiveness (Hammen, 2016; Liu et al., 2024). Furthermore, many studies collect data only on dependent but not on independent stressors (Rnic et al., 2023).

Cross-sectional studies are unsuitable for testing this model, given that simultaneous assessment of psychopathology and stress—or retrospective reports of stressors preceding current psychopathology - cannot distinguish stress exposure from stress generation. On the other hand, measuring only dependent stress cannot truly test the hypothesis - namely, whether fateful (independent) stressors are indeed unrelated to psychopathological variations and other relevant factors proposed by the model.

Longitudinal designs, in which the temporal sequence of psychopathology and stressful events is clearly defined, allow for an appropriate examination of the bidirectional relationship between stress generation and mental health (Bouchard & Shih, 2013). In such designs, it is essential to use contextual (semi)structured threat interviews to assess the typology and outcomes of stressful experiences to avoid validity threats specific to self-report measures. The particular conditions associated with this type of interview - which burden the research process and often leads researchers to avoid their use - include extensive training of interviewers, longer time commitments from participants, and the use of independent raters who assess the stressors via a highly detailed protocol without knowing the participants' clinical status or behavior during the interview. However, the meta-analyses have shown that self-reported stress generation is consistently more strongly associated with internalizing psychopathology, which may be due to cognitive biases among participants, resulting in more negative subjective assessments of life experiences (Liu et al., 2024; Rnic et al., 2023). The distinction between dependent and independent events is also compromised when self-report measures are used, further threatening the validity of the findings.

Future research directions

With respect to clinical factors, future research can be directed toward prior disorder history, symptom profiles, and the externalizing psychopathology spectrum and its differentiated relationship with interpersonal versus other types of generated dependent stress. Furthermore, given the established mediating role of stress in the chronic course of psychopathology, prospective monitoring of changes in diagnostic status is necessary to determine whether generated stress mediates the recurrence and duration of disorder episodes. It is also desirable to measure baseline depressive symptoms or syndromes in all studies to control their effect on the relationship between dependent stress and other predictors.

Conducting more studies with adult participants, as well as in non-Western cultures, will enable the verification of preliminary findings regarding the attenuation of stress generation in later life, as well as the identification of more nuanced cross-cultural variations that may presumably affect this process. On the other hand, examining vulnerability factors (such as impulsivity, aggression, and anger), as well as dependent stressors that are more specific to men (related to personal achievements and agency), may offer a more inclusive perspective and even potentially redefine the distinction between stressors (relational versus agentic) (Harrison et al., 2025). Protective factors, which have thus far been neglected, should also play a more prominent role in future studies. In addition to personality and interpersonal predictors, positive life events are also potential candidates, given that initial evidence of their protective role is already available (Yarrington et al., 2023).

Moreover, studies investigating stress generation in daily life via ecological momentary assessment can complement standard prospective designs. Intensive research methods, such as diary keeping or experience sampling, allow the recording of short-term stress generation processes, immediate precipitating factors, and psychopathological outcomes. The first meta-analysis in this area (Haehner et al., 2024) provides preliminary evidence for the association between stable/dispositional factors and stress generation in daily life but not for the role of momentary behavior.

Finally, future research could help identify individuals with a more pronounced biological predisposition to stress generation, which may lead to the development of personalized interventions.

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