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Viewpoint

Stressnology: The primitive (and problematic) study of life stress exposure and pressing need for better measurement

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ABSTRACT

Life stress is central to many contemporary theories of human health and behavior. Despite this fact, numerous conceptual and measurement issues remain unresolved. The present article explores these topics by first summarizing several key definitional and conceptual matters that are important for life stress research. Second, I introduce *stressnology*, defined herein as the fictitiously named, but otherwise very real and problematic approach to studying life stress exposure that involves measuring only the superficial contours of this very complex construct. Finally, I review some recent methodological advancements that have the potential to move us past primitive approaches to conceptualizing and assessing life stress. Ultimately, although the influence that life stress has on human health and behavior is profound, our understanding of this construct—and how it affects wellbeing, functioning, and development—is still very limited. Using state-of-the-art instruments for assessing life stress exposure, especially across the entire life course, should therefore be a top scientific and clinical priority.

1. Introduction

Stressnology is the fictitiously named, but otherwise very real and problematic study of life stress exposure that involves measuring only the superficial contours of this complex construct. In this article, I first provide a brief overview of key definitional and conceptual issues in life stress research. Second, I introduce *stressnology* and describe the detrimental effect that it has had on stress research. Finally, I discuss some recent methodological advancements that have the potential to move us past primitive approaches to conceptualizing and assessing life stress. Although stressnology is presently flourishing with numerous articles published annually, new methods now exist for measuring life stress exposure that have the potential to substantially enhance our understanding of life stress and its relation to human health and behavior.

2. Definitional and conceptual issues in life stress research

Life stress is a complex construct that encompasses a wide variety of different adverse social-environmental experiences called *stressors* that can differ along several dimensions, including their severity, frequency, timing, and duration (Slavich, 2016). With respect to duration, for example, stressors can occur as *acute life events*, such as getting fired from a job, or as *chronic difficulties*, such as caregiving for a terminally ill parent. Timing, in turn, refers to exactly when a stressor occurred during a person's life, frequency refers to how often it occurred, and severity refers to the degree of cognitive upheaval or psychological/contextual threat the stressor caused. Ultimately, each of these dimensions has the potential to greatly modulate a stressor's impact (Epel et al., 2018).

Stressors can also occur in different life domains and possess various social-psychological characteristics that can influence their effects (Cohen et al., in press). Some common primary life domains are education, work, housing, financial, treatment/health, marital/partner, legal/crime, and possessions. In turn, some core social-psychological characteristics include interpersonal loss, physical danger, humiliation, entrapment, and role change/disruption.

3. Stressnology

Stressnology deals with this conceptual complexity by ignoring as much of it as possible. Like its predecessor *phrenology*, which involved measuring the contours of the human skull to reveal the fundamental structure of an individual's personality, stressnologists use instruments for assessing life stress that are unable to detect some or all of the underlying dimensions described above and depicted in Fig. 1. This commonly occurs because the stress assessment instrument used

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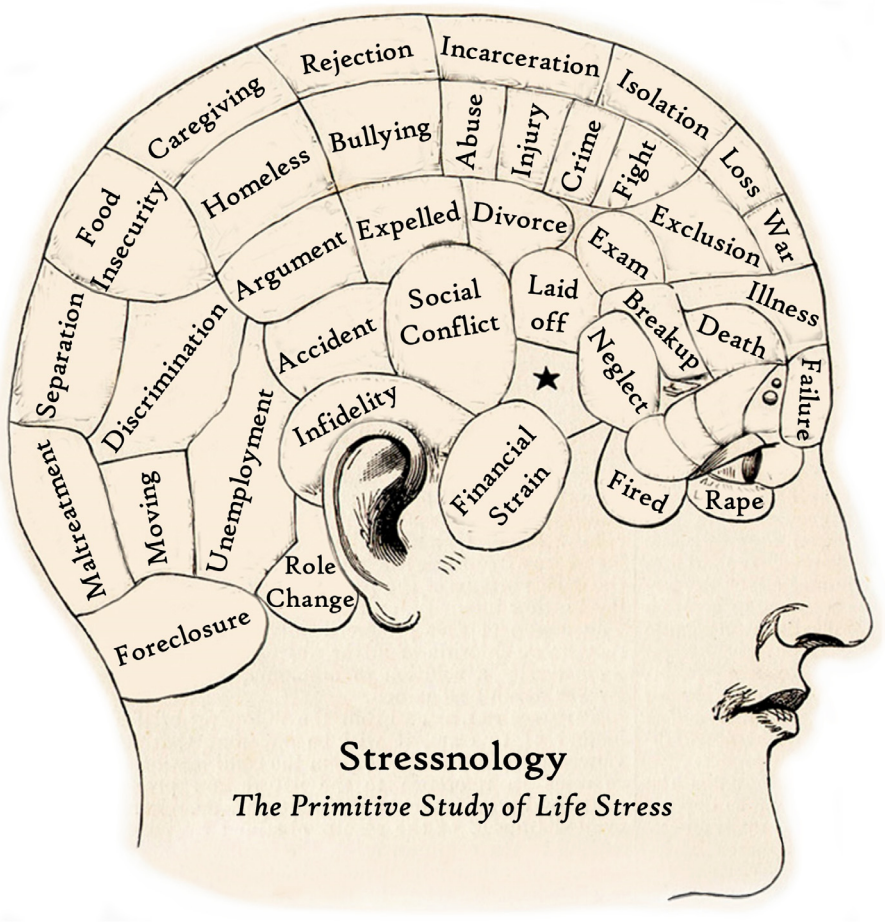

Fig. 1. Stressnology is the primitive (and problematic) study of life stress exposure that involves measuring only the superficial contours of this very complex construct. Central to stressnology is the use of instruments for assessing life stress exposure that are unable to detect some or all of the underlying dimensions of life stress depicted here. As a result of these methodological limitations, progress in formulating accurate theories of life stress—and linking life stress exposure and health—has been limited.

Table 1
Top-ten most common practices in stressnology.

1. Stressors are assessed using items that are so brief or imprecise it is unclear what actually happened to the person.
2. The assessment of stress is conflated with the outcome under study because the stress assessment instrument has items that overlap with the outcome(s) being investigated.
3. Stressor exposure timing is not assessed, or it is assessed but stressors are then bucketed into very general categories (e.g., early life, adulthood).
4. It is assumed that stressors occurring across different life domains or possessing different social-psychological characteristics are equivalent with respect to their impact.
5. The instrument used assesses stressor count or severity, but not both.
6. The instrument used assesses acute life events or chronic difficulties, but not both.
7. Instruments measuring general psychological distress or stress-related reactivity are described as indicators of stressor exposure.
8. Stressors occurring in one life domain or possessing one social-psychological characteristic are assessed, but are not compared to other stressors in order to assess their relative impact.
9. Constructs that are not life stress (e.g., sleep problems, depression) are used as indicators of life stress exposure.
10. The stress assessment window is narrow (e.g., one week or year) even though the outcome(s) being studied could have been influenced by stressors occurring over the entire lifespan.

includes items that are overly brief or imprecise. However, it can also occur when an instrument is sophisticated but used only to assess stressors occurring over a short period of time (e.g., one week or year) even though the outcome is influenced by stressors occurring over the entire lifespan (Slavich and Shields, 2018). The top-ten most common practices in stressnology are described in Table 1.

Looking back, progress in human brain mapping was arrested because phrenologists used tools that were unable to image the underlying structure and function of the human brain. Consequently, theories describing the neurobiology of human traits were highly primitive. Neuroimaging techniques like fMRI have since advanced neuroscience by generating high-resolution photographs of the human brain. Without such methods, though, contemporary theories of brain structure and function would still be limited.

Stressnology has hampered stress research in the same way that phrenology hampered neuroscience. Because of poor methods and inadequate instrumentation, stress researchers have been unable to obtain the high-resolution images needed to develop a clear picture of the underlying contours and dimensions of the life stress construct (Shields and Slavich, 2017). The "pictures" taken by the most commonly used stress assessment instruments (i.e., checklist measures) are imprecise and include substantial measurement error, and those that are high resolution (i.e., interview-based measures) cover only a small fraction of a person's life. As a result, much of the existing empirical work on life stress is crude… and so too, therefore, are our theories.

4. Moving beyond stressnology with better measurement

Stress research needs its *fMRI moment*—a point when advanced instrumentation begins to generate high-resolution data that in turn enhance theory on this centrally important construct. For outcomes that

are influenced only by recent stressors, the Life Events and Difficulties Schedule (LEDS; Brown and Harris, 1978) remains the gold standard. The LEDS employs a semi-structured interview to obtain extensive contextual information about the recent stressors experienced, and raters then independently judge the stressors' severity, frequency, timing, and duration. Two well-validated alternatives to the LEDS are the UCLA Life Stress Interview (Adrian and Hammen, 1993) and Kendler Life Stress Interview (Kendler et al., 1998). Like the LEDS, these systems both utilize detailed interviews and an independent panel of raters, but they are more scalable than the LEDS as they assess fewer stressors. Two computerized versions of the LEDS have also been developed (i.e., the Computerised Life Events and Assessment Record and the Life Events Assessment Profile), but validation data is presently limited.

When stressors occurring over the entire lifespan are relevant, the Stress and Adversity Inventory (STRAIN) is more appropriate (Slavich and Shields, 2018). The STRAIN covers all of the life domains and social-psychological characteristics addressed by the LEDS, but it is completely online and covers the entire lifespan (http://www.strainsetup.com). STRAIN-based panoramic snapshots of individuals' cumulative lifetime stress exposure have so far been use to predict a variety of outcomes, including memory and executive function; HPA-axis, metabolic, and immunologic function; sleep difficulties; fatigue; birth timing; and physical and mental health problems (e.g., Cuneo et al., 2017; Slavich and Shields, 2018). Tools like the STRAIN may thus yield the kind of high-resolution lifetime stress exposure data needed to get us past the dark days of stressnology. Regardless of the specific stress assessment instrument used, though, it will still be incumbent upon investigators to analyze data in ways that can reveal *stressor-specific effects*.

5. Conclusion

In conclusion, theories of life stress can only be as sophisticated as the tools we have to measure this construct—and so far, our methods and instrumentation have been poor. So serious are these issues that some have called for scientists to abandon the term *stress* altogether (Kagan, 2016). My view is more positive. After all, if neuroscientists could move beyond phrenology, then surely we can get past stressnology.

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Conflicts of interest

There are no conflicts of interest with respect to the authorship or publication of this article.

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